

Upper Briggs Restoration Project Wildlife Report & Biological Evaluation Addendum and Changed Conditions Analysis

Wild Rivers Ranger District, Rogue River-Siskiyou National Forest, Josephine County,
Oregon

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Intro

This addendum to the Upper Briggs Creek Wildlife BE and Specialist Report evaluates the changed conditions in habitat caused by the 2018 Taylor and Klondike fires for species potentially impacted by the proposed Upper Briggs Creek Restoration Project, hereafter “the Project”.

Changed Conditions

Upper Briggs Sixth-field Watershed and Proposed Action

The entire Upper Briggs Creek sixth-field watershed was within the fire perimeter. Table 1 displays the amount of acres burned by estimated % basal area (ba) loss from RAVG data:

Table 1. Upper Briggs Watershed Acres Burned (RAVG Oct 19, 2018)

%BA Loss	Acres	%Watershed
1-25	4,608	19
26-50	2,607	10
51-75	1,634	7
76-100	3,801	15

Based on these data, approximately 51 percent of the sixth-field watershed experienced some measurable amount of basal area loss from fire. Twenty-two percent of the watershed had more than 50 percent basal area loss. Table 2 displays acres burned in the Alternative 2 (Proposed Action) units grouped by primary treatment objective.

Table 2. Alternative 2 Primary Treatment Objective Acres Burned (RAVG Oct 19, 2018).

Primary Treatment Objective (total acres)	1-25% ba loss	26-50% ba loss	51-75% ba loss	76-100% ba loss	Acres Burned (% total)
DELSH (1055)	222	105	50	52	429 (41)
Riparian Restoration (184)	93	22	4	0	119 (65)
Roadside FMZ (714)	198	112	52	71	433 (61)
Pine Oak (706)	177	71	31	32	311(44)
Rare Plants (42)	5	15	9	4	33 (79)
Meadow Restoration (188)	35	24	24	26	109 (58)
Ridgeline FMZ (1133)	291	180	95	95	661(58)
Total Acres (% of 4017)	1021 (25)	529 (13)	265 (6)	280 (7)	2,095 (52)

In addition, suppression activities such as fire line, safety zone, and staging area construction, and roadside danger tree mitigation have affected the habitat conditions in the watershed. Large fire lines, safety zones and staging areas are captured by the RAVG data and are included in acres with basal area loss. To ensure public safety, dead trees that would land on roads open to the public are cut down which will continue as additional trees die. Approximately 13 percent of the Upper Briggs sixth-field watershed is within 250 feet of roads open to the public that burned in the fires.

Proposed treatments have been modified considering fire effects while maintaining the intent to achieve treatment objectives for each unit (See the Project post-fire silviculture discussion). In general, thinning would be reduced or may not occur in areas with > 50% basal area loss, and may be reduced in additional burned areas depending on site specific conditions and would not occur in areas with more than 25% basal area loss in riparian restoration treatments. Landing and temporary road construction would be reduced due to fewer acres of thinning treatments. Prescribed fire would be delayed in burned areas.

All project design criteria (PDC) specified in the final EA would be implemented. In addition, the red tree vole high priority site conservation plan was modified post-fire and those acres of high priority sites or connectivity corridors that overlap proposed units would have modified treatments. *Any treatment of acres within the Briggs Creek RTV Plan would be consistent with red tree vole conservation per management recommendations.* Also, *northern spotted owl post-fire foraging habitat* (PFF, NRF that burned with >50% basal area loss) *within and adjacent to treatment areas would be retained to the extent possible, however danger trees may be felled and left for down wood.*

Meadow Restoration units would be treated for conifer encroachment with retention of legacy trees and snags. Basal area loss in meadows includes tree, shrub and grass cover that burned. Meadow restoration activities such as seeding with native grasses and forbs and shrubs where appropriate, treating brush to increase forage and productivity, and future burning may occur throughout the units.

Dead Wood

The Forest Service Region 6 uses the DecAID model to evaluate snag and down wood densities at the watershed scale (<http://www.fs.fed.us/r6/nr/wildlife/decaid/>). DecAID is an advisory tool based on best available science to help determine reference and current conditions for large snags and other dead wood at the watershed scale (Mellen-McLean and others 2012). It is based on data from inventory plots in unharvested stands to provide dead wood distribution that represents natural variation for comparison with the current distribution of dead wood in a watershed. This provides a basis to evaluate the effects of management activities on dead wood levels and the organisms that use decayed wood and considerations for dead wood management.

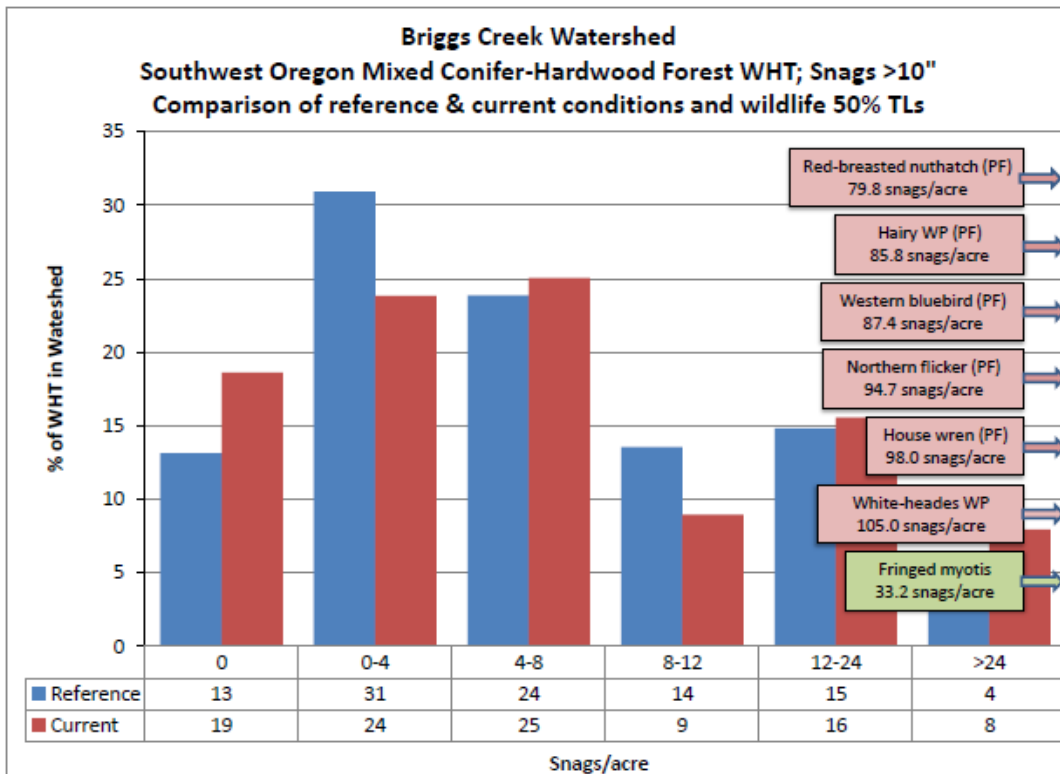
For the Briggs Creek fifth-field watershed, southwest Oregon mixed conifer-hardwood is the forest habitat type characterized by the plot data used for the DecAID analysis. The GNN vegetation data provides the best current scientific data on dead wood ecosystem attributes (see this website for an explanation of GNN spatial data <http://lemma.forestry.oregonstate.edu/methods>). While not perfect at a site specific or stand level scale, GNN data helps to show general trends at a landscape scale. RAVG fire intensity data for the Klondike and Taylor Creek fires were used to update the GNN vegetation data used for this analysis which was the best data available for the project timeline. These data estimate approximately 64 percent of the fifth-field watershed experienced fire intensity that resulted in 1 percent or more basal area mortality, of which 28 percent burned with greater than 50 percent basal area mortality.

Snags

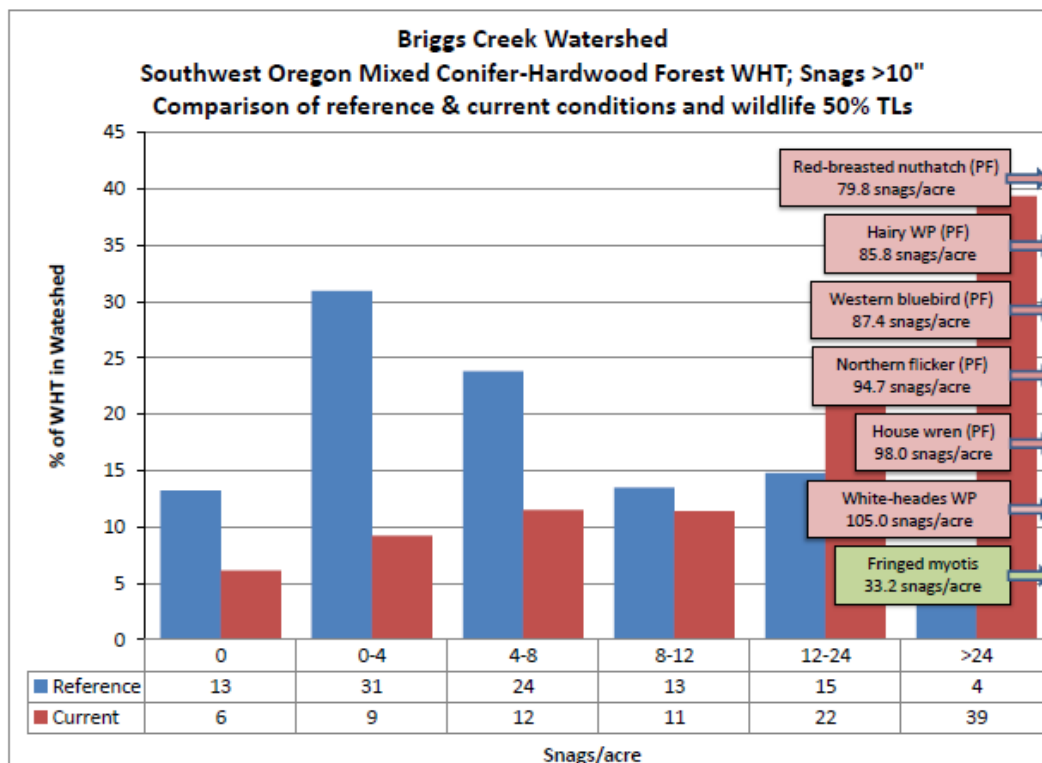
Figures 1 through 4 compare pre- and post-fire snags per acre. Down wood distribution is measured by percent cover which represents the abundance of down wood in an area providing cover for wildlife species. Information needed to model post-fire down wood is not available so assumptions about post-fire down wood are based on pre-fire histograms and the amount of high fire intensity in the watershed.

In addition, 50 percent tolerance levels for certain species that use snags are displayed. These tolerance levels indicate the density of snags per acre that 50 percent of individuals in the population of a species would use within this habitat type, while the other 50 percent would use a higher amount. For example, 50 percent of fringed myotis (bats) in the population would use habitat with approximately 33.2 snags per acre while the other 50 percent would use habitat with more snags per acre (Figure 1).

Figure 1 shows that prior to the fire, the Briggs Creek watershed was 6 percent deficient in snags per acre compared to reference conditions (19 vs 13 percent of the watershed with 0 snags per acre) although it had twice as much area with over 24 snags per acre than reference (8 vs 4 percent).

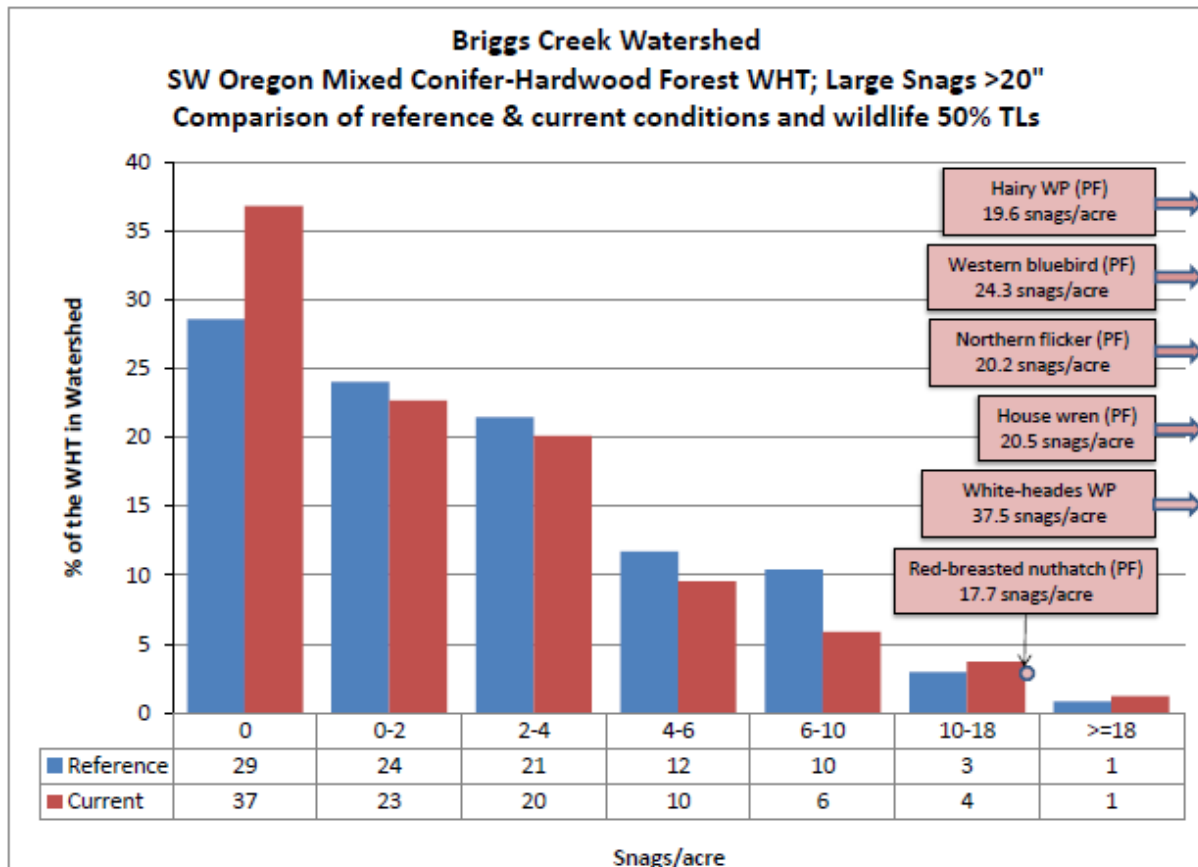
Figure 1. Pre-fire distribution of all snags > 10" diameter per acre within Briggs Creek watershed.

Post-fire (Figure 2), the overall snag deficiency was made up and the snag distribution exceeds the reference condition by 7 percent (6 vs 13 with 0 snags per acre). Furthermore, there are nearly 10 times more acres than the reference condition with more than 24 snags per acre (39 vs 4 percent).

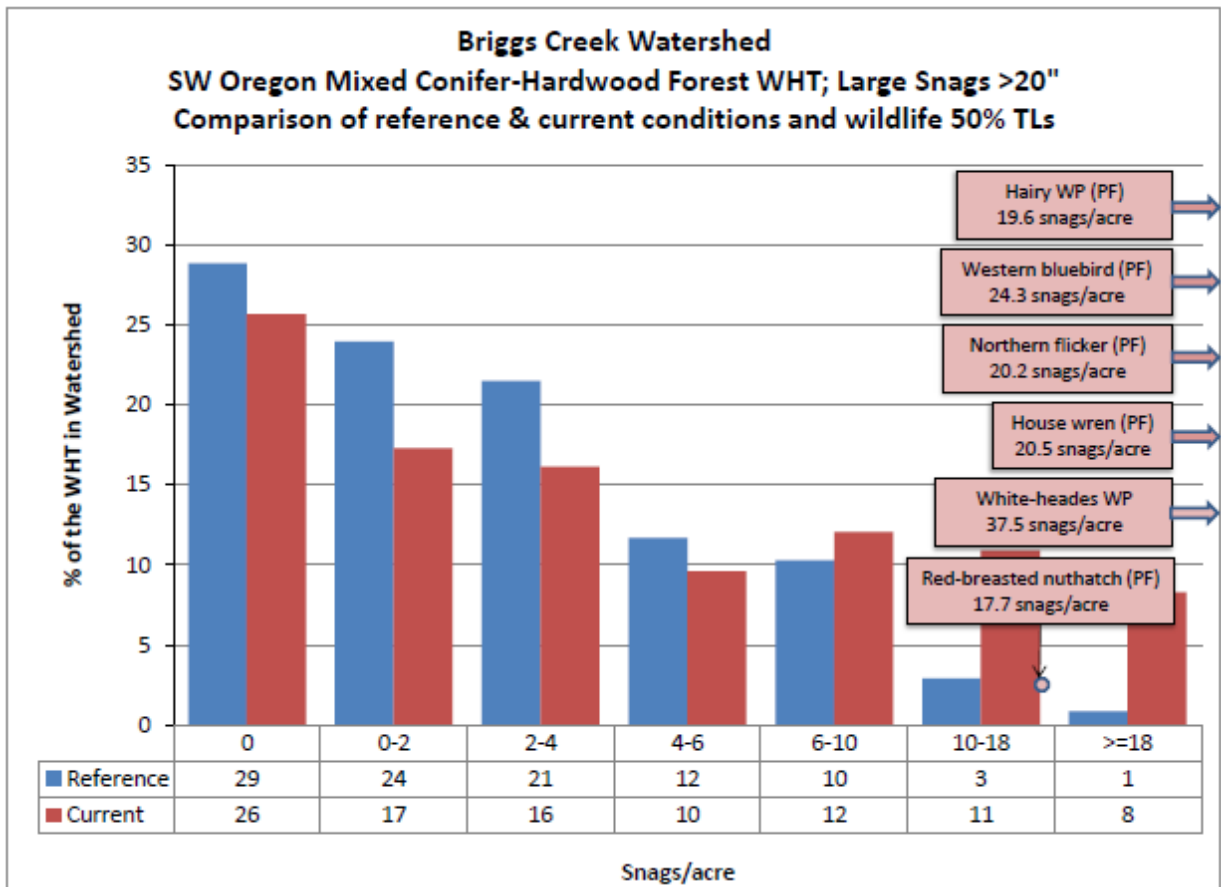
Figure 2. Post-fire distribution of all snags >10 inches diameter per acre within Briggs Creek watershed.

Inventory data for large snags (>20 inches diameter) prior to the fires suggest the Briggs Creek watershed was 8 percent deficient in area with large snags per acre compared to reference conditions (37 vs 29 percent area with 0 snags) with deficiencies in ranges with <10 snags per acre and a slightly higher amount of acres with more than 10 snags per (Figure 3).

Figure 3. Pre-fire distribution of snags >20 inches diameter per acre within the Briggs Creek watershed.



Post-fire distribution in Figure 4 shows the watershed now has more acres with large snags than reference (26 vs 29 with 0 snags per acre) and has considerably more area with higher densities of large snags. However, the distribution is still skewed with less than reference distributions of lower densities of large snags (0 to 6 snags per acre). Overall, areas with higher densities of snags of all sizes potentially provide more suitable habitat for cavity nesters and bats than reference conditions.

Figure 4. Post-fire distribution of snags >20 inches diameter per acre within Briggs Creek watershed.

Down Wood

Figure 5 compares reference and pre-fire distributions of all down wood greater than 5 inches diameter in the Briggs Creek watershed.

Overall, the Briggs Creek watershed had more down wood pre-fire than the reference condition indicated by the amount of the watershed with 0 percent cover (18 vs 28 percent). This is evident in the amount of acres with 0-4 and 6-8 percent cover being higher than reference.

Furthermore, down wood greater than 20 inches diameter is used by fisher, marten and other mammals. Figure 6 compares the distribution of large down wood between pre-fire and reference conditions in the Briggs Creek watershed. Overall, the watershed had a little more large down wood cover than reference conditions with a slight deficiency in area with greater than 4 percent cover. It is unknown how much down wood was consumed during the fire, but approximately 64 percent of the watershed experienced fire effects that resulted in 1 percent or more basal area loss and down wood is accumulating as weakened trees continue to fall. Considering this and the high amount of snags in the watershed post-fire, the amount of down wood of all sizes is expected to increase over time and reach or exceed reference conditions.

Figure 5. Distribution of down wood > 5 inches diameter by percent cover within Briggs Creek watershed.

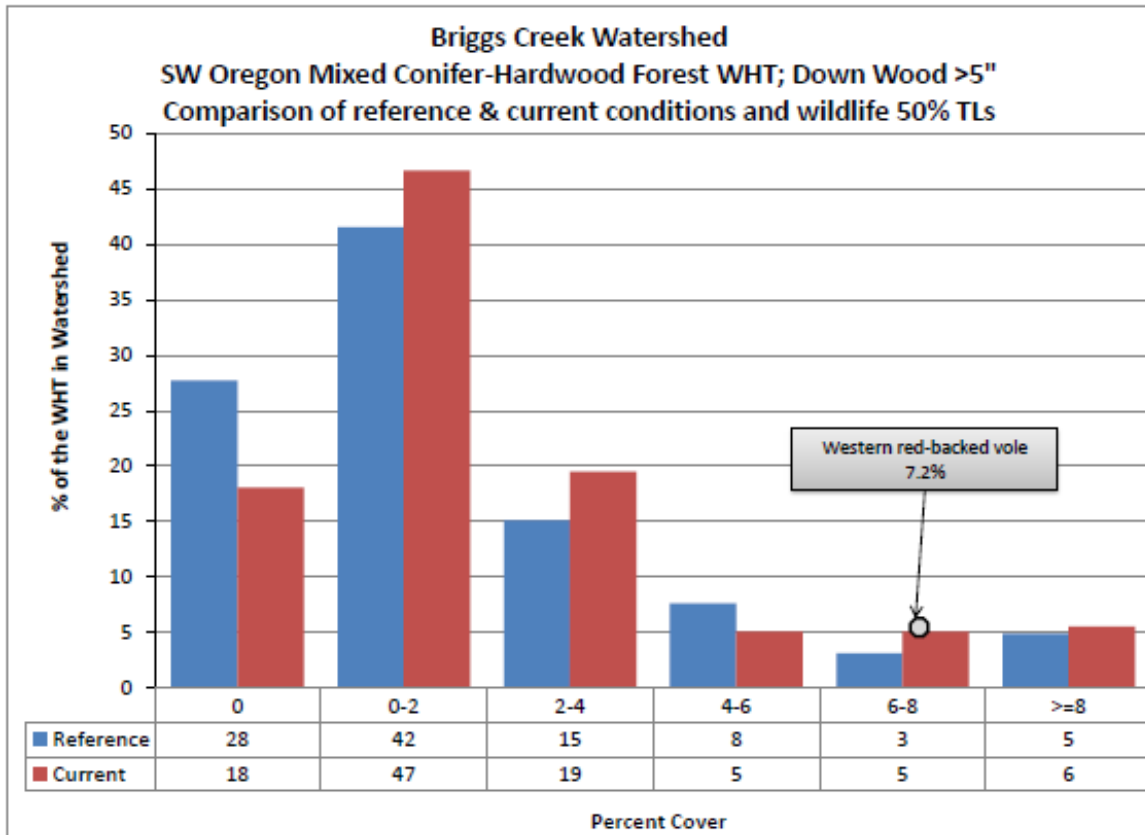
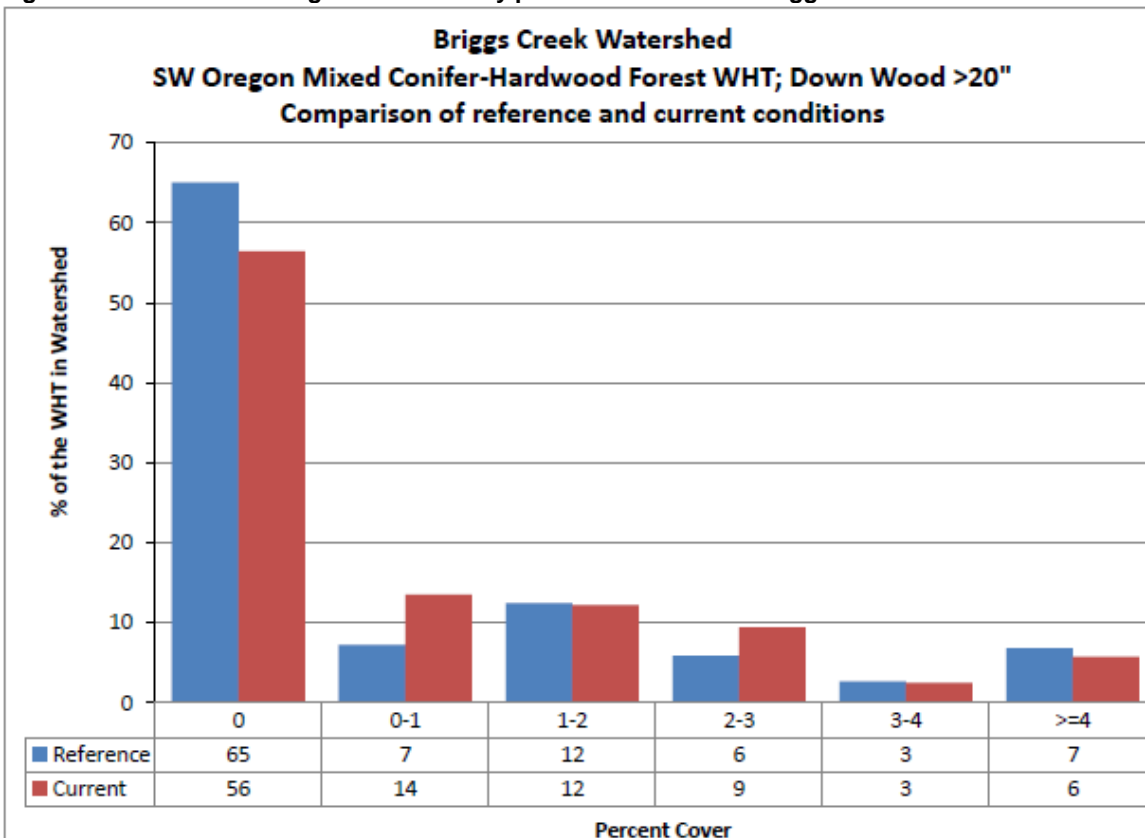


Figure 6. Distribution of large down wood by percent cover within Briggs Creek watershed.



Site Specific Dead Wood

Snags are expected to continue to accrue in and adjacent to the proposed units due to delayed stress response from fire effects, and down wood will also increase as snags decay and fall. Project design criteria specify that project activities would avoid disturbance of and protect existing snags and down wood ≥ 10 inches dbh to the greatest extent possible. Treatment skips would be used to avoid disturbance of large dead wood (>20 inches dbh) or areas of accumulated dead wood. Damaged, cull or defective trees would be left on site. Snags would be created in units where snags are deficient (< 4 snags per acre) and where it is desirable to eliminate trees $>10''$ dbh. For example, where a Douglas-fir could be girdled to favor a black oak. Distribute as singles and clumps, across all treatment types.

Post-fire foraging (PFF) for northern spotted owls exists in the project area where nesting, roosting, and foraging (NRF) habitat was burned to where it no longer functions as NRF ($>50\%$ ba loss), but may still provide foraging opportunities for owls, particularly mice. This *PFF habitat would be retained to the extent possible and only affected where occasional snags may be felled for safety concerns during project activities, but left on-site for down wood.*

Species Potentially Impacted

There are no changes to species potentially impacted by the project. The final Project Wildlife Report and BE (December 2018) identifies federally threatened species for which no effect was determined, and also sensitive species for which there would be “no impact” from the Project. A compliance report for the northern spotted owl consultation and biological opinion (June 29, 2017) was also prepared and submitted to The Service on February 4, 2019 and the letter of concurrence was received by the Forest on February 9, 2019. The Service concurred with the conclusion of the assessment that effects of the fire combined with the effects of the post-fire proposed action would not exceed the effects anticipated in the 2017 Biological Opinion. Consultation re-initiation was not triggered and no subsequent changes to the Opinion are needed. A summary of the analysis is provided later in this document.

As of September 2018, the west coast distinct population of the Pacific fisher is considered a species proposed for federal listing under ESA. Effects of the proposed action to this species have been evaluated with consideration for potential listing.

In addition, conferencing for the Humboldt marten (*Martes caurina humboldtensis*), subspecies of the Pacific marten (*Martes caurina*) is not required because the Project does not overlap the known range for this subspecies (USFWS 2018). Therefore, there would be “no effect” to the Humboldt marten.

Following are those regionally sensitive species, Northwest Forest Plan (NWFP) Survey and Manage, and Siskiyou National Forest Plan management indicator species (MIS) previously analyzed in the Project Wildlife Report and BE because their habitat or individuals could be impacted by activities. The conclusion of Project effects for all of these species prior to the fires was “**May Impact Individuals and or Habitat, but not likely contribute towards a trend to federal listing or a loss of viability to the population or species**”.

R6 Sensitive:

Pacific fisher	Oregon shoulderband	Coronis fritillary
Pacific marten	Travelling	Johnson’s hairstreak
Lewis’ woodpecker	shoulderband	Pallid bat
White-headed woodpecker	Franklin’s bumble bee	
Purple martin	Western bumble bee	

NWFP Survey and Manage:

Great gray owl, Oregon red tree vole, Chase sideband

Siskiyou National Forest LRMP Management Indicator Species (MIS):

Spotted owl, woodpeckers, Pacific marten, deer & elk

Table 3 summarizes how changed conditions from the 2018 fires interact with R6 Sensitive Species and NWFP Survey and Manage species and if there is a need for further analysis of the project effects due to the changed conditions.

Table 3. Summary of changed conditions for R6 sensitive species and NWFP Survey and Manage species previously analyzed in the Project Wildlife Report and BE.

Common Name	Interaction of changed condition with individuals or habitat and Proposed Action
R6 Sensitive Species	
Pacific fisher	Approximately 20 percent of the pre-fire denning/resting habitat in the sixth-field watershed experienced more than 50% basal area mortality and is no longer considered denning/resting habitat. Approximately 5 percent had 26 to 50 percent basal area mortality and may still function as denning/resting habitat where percent mortality was closer to 26 and pre-fire canopy cover at least 85 percent. Additional evaluation of project effects is provided later in this document including PDC to avoid impacts to potential den sites.
Pacific marten	The fires resulted in short-term removal of understory vegetation in approximately 50 percent of the sixth-field watershed which has temporarily reduced stand complexity in suitable mature forest habitat. Long-term fire recovery (shrub regeneration in areas with large snags and down wood) and treatments to enhance stand complexity in DELSH units would provide more potential habitat for martens than what was expected in the previous analysis. 17 percent of the FMZ treatment areas experienced >50% ba loss which is a short-term loss of late successional forest habitat for marten. These acres would be included in the long-term FMZ maintenance that would reduce understory complexity for up to 10% of the watershed as previously analyzed. No change in impacts from previous analysis, no further analysis needed.
Lewis' woodpecker & White-headed woodpecker	Overall, the fires increased snags and open areas favoring pine and oak regeneration. Pine-oak and FMZ treatments would favor development of large pine and open habitat in 7-10% of the sixth-field watershed. DELSH treatments would increase late successional habitat structure for WHW. Incidental loss of snags may occur for danger tree mitigation. No change in impacts from previous analysis, no further analysis needed.
Purple martin	The fires increased snags and edge habitat in riparian and meadow areas. Purple martins would benefit from riparian and meadow restoration treatments that increase or maintain riparian and edge diversity proposed in less than 2% of the sixth-field watershed. Incidental loss of snags may occur for danger tree mitigation. No change in impacts from previous analysis, no further analysis needed.

Oregon shoulderband & Travelling sideband	<p>Oregon shoulderband unlikely inhabitant, Travelling sideband common in watershed.</p> <p>The fires burned through the understory in at least 50 percent of the sixth-field watershed. Many burnt mollusk shells have been found throughout the project area and it assumed that the fires resulted in at least a short-term decrease in the travelling sideband population. However, suitable unburned habitat is still present in a mosaic throughout the watershed where unburned mollusk shells have been observed which is normal in the fall. Twenty-six percent of the watershed with >50% ba loss likely resulted in loss of suitable habitat for these species. Thirteen percent of units proposed in Alternative 2 burned with more than 50% basal area loss. Proposed activities in the unburned portion of units may disturb remaining suitable habitat or individuals. PDC to protect existing down wood, hardwood retention, and seasonal restrictions for NSO would reduce potential impacts to these species.</p> <p>No change in impacts from the previous analysis, no further analysis is needed.</p>
Franklin's & Western bumble bees	<p>The fires resulted in short-term loss of late-season nectar and pollen sources in the sixth-field watershed. Long-term increase in nectar and pollen sources is expected in areas that now have less overstory canopy (at least 26% of the watershed).</p> <p>Treatments that increase understory sunlight and flowering plant diversity would provide more nectar and pollen. Ground disturbing activities could harm individuals, damage nest sites or cause short-term loss of forage. These activities would occur within a smaller proportion of the treatment units than previously analyzed and treatment timing would vary.</p> <p>With the post-fire increase in habitat and less disturbed area, there is no change in impacts from the previous analysis and no further analysis needed.</p>
Coronis fritillary	<p>A very small amount of potential larval habitat in the sixth-field watershed (serpentine with <i>viola halli</i>) may have burned in the fires, but would likely recover in the next growing season.</p> <p>FMZ maintenance (prescribed fire) may affect potential larval habitat and nectar sources and harm individuals if burned in the spring. Nectar sources (forage) may be enhanced by treatments that increase sunlight and understory diversity. <i>Avoid spring burning in serpentine areas with Viola halli.</i></p> <p>No change in impacts from previous analysis and no further analysis needed.</p>
Johnson's hairstreak	<p>The fires and associated suppression activities resulted in loss of mature pines throughout at least 50 percent of the sixth-field watershed and likely loss of associated dwarf mistletoe (<i>Arceuthobium spp</i>) which provides food for larvae of this species.</p> <p>Treatments that increase development of late successional habitat and favor ponderosa and Jeffery pine would benefit this species along with treatments that increase nectar sources.</p> <p>The Project may cause short-term loss of nectar from prescribed fire. Incidence of eggs or larvae lost from disturbance or removal of suitable mistletoe host would be low since legacy pines will be retained.</p> <p>No change in impacts from previous analysis and no further analysis needed.</p>
Pallid bat, Fringed myotis	<p>Overall, the fires increased snags in the sixth-field watershed (although up to 13% of the watershed may have danger tree mitigation from fire-killed trees) and created more habitat for these bats than what was available prior to the fires.</p> <p>Incidental loss of snags or potential disturbance of individuals from project activities and danger tree mitigation may occur. Retention and promotion of legacy trees in treatment units would promote future large snag habitat.</p> <p>No change in impacts from previous analysis and no further analysis needed.</p>
Northwest Forest Plan Survey and Manage Species	
Great gray owl	<p>There are no known sites for this species that require protection by the Project. No change from previous analysis, no further analysis needed.</p>

Oregon red tree vole (RTV)	The RTV High Priority Site Conservation Plan for the Briggs Creek 5 th field watershed has been revised based on changed conditions to RTV habitat caused by the fires, and internal and public review. This Conservation Plan is available in the project record. Appendix B of this report and the final EA for this project include a summary of the RTV Conservation Plan the effects of the RTV Plan to other resources and the Upper Briggs Restoration Project proposed activities.
Chase sideband	There are no known sites for this species that require protection by the Project. No change from previous analysis, no further analysis needed.

MIS

Baseline habitats previously documented for the Siskiyou National Forest MIS in 2011 (USDA Forest Service 2012) have been considerably affected by the 2017 and 2018 fires. Table 4 compares the habitat available in the 2012 Forest document to the 2012 GNN data and the 2012 GNN data updated with fire severity (BARC) or fire intensity mapping (RAVG) for fires that have occurred through 2018.

The habitat data source explains much of the difference between the 2011 MIS report versus the 2012 GNN habitat data. The 2011 habitat data were based on general cover type mapping derived from satellite data acquired in 1988 and 1991 used for the Northwest Forest Plan, and was updated after the 2002 Biscuit fire. The GNN data is based on satellite imagery acquired in 2011 and has been updated for large fires that have occurred on the forest between 2011 and 2018.

Table 4. Comparison of MIS habitat in 2011 report with the 2012 GNN and 2018 post-fire habitat for the Siskiyou National Forest.

Management Indicator Species	Habitat Acres 2011 (% of SNF)	2012 GNN Habitat Acres (% of SNF)	2018 Post-fire Habitat Acres (% of SNF)	Change in Habitat Acres (2012-2018)	% Change of Habitat since 2012
Northern spotted owl (mature and old growth)	368,428 (34)	374,720 (34)	364,231 (33)	-10,489	-3%
American marten (mature forest)	368,428 (34)	374,720 (34)	364,231 (33)	-10,489	-3%
Pileated woodpecker (mature forest)	368,428 (34)	374,720 (34)	364,231 (33)	-10,489	-3%
Woodpeckers ¹ (unmanaged, snags)	864,290 (79)	953,094 (87)	953,094 (87)	0	0
Deer and elk (thermal/hiding)	368,428 (34)	762,311 (70)	732,488 (67)	-29,863	-4%
Deer and elk (forage)	486,985 (45)	300,228 (28)	330,963 (30)	+30,735	+10%

¹ 2012 data includes managed stands. 2018 acres assume that all acres provide potential snag habitat regardless of burned or unburned, however the density of snags on burned acres (43,190 acres) has increased. This would especially benefit woodpecker species that use post-fire habitat (see also the DecAID analysis).

Habitat trends for MIS displayed in Table 4 show that the greatest change due to fire was the 10 percent gain in early seral habitat which benefits deer and elk forage and is mostly related to the loss of thermal/hiding cover. The difference in forage from 2011 to 2012 is attributed mostly to young plantations and thinned stands included in the 2011 foraging habitat that are considered hiding/thermal cover in the 2012 data because they have at least 40% canopy cover. Therefore, the difference in thermal/hiding cover from 2011 to 2012 is that younger stands are considered to provide hiding cover, while the 2011 report only accounted for the thermal cover of mature forest (20+ inch DBH with 40%+ canopy cover).

Finally, while late successional forest has decreased by about 3 percent at the forest level, early

seral (deer/elk forage) and late successional habitat now each comprise nearly 1/3 of the Siskiyou NF MIS habitats. Snag habitat for woodpeckers has actually increased with the large fires described in the footnote of Table 4.

Considerations for cumulative effects include impacts to snags from roadside danger tree treatments for the 2017 Chetco Bar fire, the 2018 Natchez, Taylor and Klondike Fires and the Chetco Bar Fire salvage project. Assuming that all acres within 200 feet of roads open to the public have been treated or would potentially be treated, plus the 4,090 acres of the Chetco Bar salvage project, snag cutting would occur on a maximum of approximately 32,230 across the Siskiyou NF. This is 3% of the habitat identified for woodpeckers across the forest, though the Chetco Bar Fire Salvage mitigation requirements maintain specific numbers of snags per acre to meet Forest Plan standards for woodpeckers and cavity nesters. The Shasta-Agness Restoration Project on the Gold Beach and Wild Rivers Districts may also cause incidental loss of snags due to thinning and burning treatments. On-going recreation site hazard tree and roadside danger tree mitigation (outside the fire area) where scattered small clumps or individual snags are treated usually total less than 100 snags felled per year. Vegetation management activities (thinning, underburning) are planned in approximately 7,000 acres for the Shasta-Agness project, and on-going fuel treatments in the Butcherknife Slate and Waters 2-Round Prairie fuel reduction projects cover about 5,000 acres on the Wild Rivers District. These projects would maintain functionality of existing mature and old growth forest that within those project areas, however reduction of understory shrubs and small trees would intermittently simplify stand structure. If the entire 12,000 acres of these projects were mature or old growth forest, it would comprise 3% of mature or old forest available. However, these projects include large amounts of mid-seral, young forest and hardwood habitats and treatments do not, or would not occur across all acres in the same year, so the cumulative impact on mature forest understory complexity for these projects is much less than 3% of the mature and old growth forest available. These projects would also maintain existing early seral habitat, and Shasta-Agness may create incidental amounts through small gaps or temporary roads.

Table 5. Summary of changed conditions for SNF MIS previously analyzed in the Project Wildlife Report and BE.

Common Name	Interaction of changed condition with individuals or habitat and Alternative 2
SNF MIS	
Northern Spotted Owl	At the forest scale, the proposed action would downgrade a small amount of NRF habitat (0.1 percent of mature forest habitat on the SNF) for FMZs. This represents a very small contribution to cumulative effects at the Forest level, and none of the current or foreseeable projects described above would downgrade NRF. Legacy trees and down wood would be retained where they exist and these stands would still function as dispersal habitat. Treatments in approximately 1,600 acres of younger stands would promote development of mature forest (<1% at the forest level).
American (Pacific) Marten	At the forest scale, treatments are expected to reduce the understory complexity and overstory density of a small amount (0.1%) of mature forest habitat for FMZs but would retain legacy trees and down wood per project design criteria. This would be a small contribution to cumulative effects at the Forest level described above. Treatments in younger stands would promote development of mature forest (<1% at the forest level).
Pileated Woodpecker	At the forest scale, the project may cause a small loss of snag habitat to danger tree mitigation which would be a very small contribution to cumulative effects to snag habitat at the Forest level described above, while treatments that enhance and develop late successional habitat would promote a small (<1%) increase of mature forest.

Woodpeckers	More snag habitat is available now than prior to the fire. Snags felled incidentally as danger trees in units during project implementation is expected to be a very small contribution to cumulative effects at the forest scale. The project would result in less than a 1% contribution to open pine and oak habitats for woodpeckers at the forest scale.
Deer and Elk	At the Forest scale, approximately 0.1% loss of hiding or thermal cover may occur in FMZ units which would be additive to cumulative effects of other fuel reduction projects described above. Also at the Forest scale, treatments that in the long-term enhance stand complexity or rejuvenate shrubs, forbs and meadow habitat would increase in cover and foraging habitat by approximately 1% combined.

Changed Condition Analysis – Terrestrial Wildlife

The following section describes the change in extent and intensity or degree of effects of the Project proposed action for the northern spotted owl (federally threatened), Pacific fisher (federally proposed), migratory birds and pollinators previously analyzed in the Project Wildlife Report and Biological Evaluation. Primary changes to the proposed action are fewer acres impacted by thinning, landings, and temp roads, or delayed treatments (fuel treatments and underburning). However, the mechanisms for effects are the same as previously analyzed.

Background for Cumulative Effects

Approximately 98 percent of Upper Briggs Creek watershed is National Forest, managed by the Wild Rivers Ranger District. Approximately 20 percent of the watershed is composed of managed stands with some level of past timber harvest. Activities occurring or reasonably certain to occur on National Forest lands within the Upper Briggs Creek watershed separate from the proposed project include plantation thinning, slash treatment, and underburning; fuel wood cutting; road maintenance; roadside danger tree mitigation, recreation site maintenance including hazard tree mitigation, and invasive weed treatments. To avoid or minimize adverse effects on spotted owls, all activities employ mandatory protection measures similar to Upper Briggs (appendix A), unless consultation with the U.S. Fish and Wildlife Service (USFWS) allows otherwise.

The small amount of private land in the sixth-field watershed is generally managed for timber production, mining and residential use. Industrial lands are managed in accordance with the Oregon Forest Practices Act. The OFPA requires modification of activities in some cases for wildlife species identified as sensitive, threatened, or endangered (<http://www.oregon.gov/ODF/Working/Pages/FPA.aspx>). Salvage of burned timber has occurred and is expected to continue on private lands that burned within the analysis area. These acres are not included in habitat calculations.

Recreational use occurs year-round though the most use occurs when the roads are clear of snow. Trails and roads receive motorized and non-motorized use. Developed and dispersed camping and game and mushroom hunting occur seasonally. Larger group events that utilize the campgrounds and trails occur annually. The Upper Briggs area is also popular for small type mining, panning, sluicing, and suction dredging, since this area is not closed to suction dredging per the state of Oregon.

Federally Listed or Proposed Species

Northern Spotted Owl

Adverse impacts to the northern spotted owl (NSO) by the Project would be short-term with long-term benefits such as increasing resilience and biodiversity in the watershed. A consultation compliance report to evaluate the effects of the Project considering the changed conditions of NSO habitat due to the 2018 fires was submitted to the Service on February 4, 2019. It was determined that the effects from implementing the “post-fire” Proposed Action would remain consistent with the original Biological Assessment and Biological Opinion completed in 2017 and re-initiation of

consultation unnecessary. The report is available in the project record and a summary is provided below. All mandatory conservation measures (project design criteria) and terms and conditions from the Project biological opinion would be implemented.

The following describes the degree of changes in habitat baseline conditions due to the 2018 fires for various scales of analysis in the NSO Biological Assessment:

- Action Area: 9 percent reduction of NRF, 16 percent reduction of dispersal-only, 7 percent now post-fire foraging (PFF).
- Critical Habitat unit KLW2: 42 percent reduction of NRF, 23 percent reduction of total dispersal
- Four 5th Field Watersheds: 13 percent reduction of total dispersal in Lower Applegate; 29 percent reduction in Briggs Creek; 30 percent reduction in Silver Creek; 22 percent reduction in Hellgate Canyon-Rogue River (Briggs Creek and Silver Creek now have less than 50 percent dispersal habitat with 49 and 25 percent respectively).
- NRF within the Nest Patch, Core Area, Home Range for 7 known sites in the Action Area (see Table 9 for details):
 - a. Pre-fire NRF in nest-patches ranged from 23-86 percent, post-fire ranges from 20-59 percent.
 - b. Pre-fire NRF in core areas ranged from 30-50 percent, post-fire, the core areas range from 19-46 percent NRF. None of the core areas currently meet the minimum NRF threshold of 50 percent needed to support reproductive success of NSO.
 - c. Pre-fire NRF in home ranges ranged from 28-44 percent, post-fire, the home ranges have from 18-37 percent NRF. None currently meet the minimum NRF threshold of 40 percent needed to support reproductive success.
- NRF within Action Area outside of known NSO Home Ranges: 40 percent reduction

Table 6 displays the pre- and post-fire comparison of acres of NSO habitat within proposed treatments under Alternative 2. PFF would be retained as explained previously, but is included to show the amount of this habitat within the proposed action acres.

Table 6. Total acres of NSO habitat affected by proposed treatments and temp road/landing construction

Treatment Type	Pre-Fire Acres	Post-fire Acres
Develop and Enhance Late Successional Habitat		
(Incl. rare plant, riparian reserve and FMZ objectives)	1,254 (total)	
NRF (<i>treat and maintain</i>)	331	269
PFF	0	9
Dispersal (<i>treat and maintain</i>)	606	578
Pine Oak Restoration	706	
(Incl. rare plant and FMZ objectives)		
NRF (<i>downgrade with legacy retention</i>)	127	77
NRF (<i>treat and maintain riparian and RTV HPS</i>)	8	11
PFF	0	14
Dispersal (<i>treat and maintain</i>)	435	408
Meadow Restoration¹	188	
Dispersal (<i>treat and maintain riparian</i>)	65	44
Dispersal (<i>removal with legacy retention</i>)	30	15
Roadside FMZ	620	
NRF (<i>treat and maintain</i>)	170	120

Treatment Type	Pre-Fire Acres	Post-fire Acres
PFF	0	9
Dispersal (<i>treat and maintain</i>)	278	239
Strategic Ridgeline FMZ	1,250	
NRF (<i>treat and maintain riparian and RTV HPS</i>)	43	32
NRF (<i>downgrade with legacy retention</i>)	424	281
PFF	0	64
Dispersal (<i>treat and maintain</i>)	578	395
Estimated Temp Road and Landing Construction²	37.5	
NRF (removal)	15.5	15.5
Dispersal (removal)	22	22

¹The original table had the acres for the two dispersal categories reversed, the correct acres are shown.

²These acres would be reduced now that more non-habitat is available for landings

Tables 7 and 8 compare pre and post-fire acres of habitat effects for the Project Alternative 2. Treatment acres are less in the post-fire proposed action and degree of effects is less or nearly the same as what was consulted on within the action area, the entire KLV-2, and the Briggs Creek 5th field watershed shown as “% change to baseline” in Table 8.

Table 7. Pre- and Post-fire comparison of habitat affected by the proposed action

Effects to Habitat	Pre-fire Proposed Action	Post-fire Proposed Action
NRF removal	16	16
NRF downgrade	551	358
NRF treat and maintain	552	432
Dispersal removal	87	37
Dispersal treat and maintain	1,927	1,664

Table 8. Comparison of pre- and post-fire effects of proposed action to scales of analysis

Analysis Area	Effects to Habitat	Pre-fire Proposed Action Acres (% change to baseline)	Post-fire Proposed Action Acres (% change to baseline)
Action Area	NRF removal	16 (-0.16)	16 (-0.16)
	NRF downgrade	551 (-6)	358 (-5)
	NRF treat and maintain	552 (0)	432 (0)
	Dispersal removal	87 (-0.4)	37 (-0.3)
	Dispersal treat and maintain	1,927 (0)	1,664 (0)
CHU KLV-2	NRF removal	16 (-0.02)	16 (-0.03)
	NRF downgrade	509 (-0.5)	350 (-0.6)
	NRF treat and maintain	535 (0)	421 (0)
	Dispersal removal	87 (-0.2)	37 (-0.08)
	Dispersal treat and maintain	1,790 (0)	1,534 (0)
KLV-2 500-acre analysis	NRF reduced	500 (-16)	344 (-13)
	Dispersal-only reduced	63 (-1)	15 (-0.5)
Briggs Creek watershed	NRF removal	16 (-0.1)	16 (-0.2)
	NRF downgrade (to dispersal)	551 (-4)	358 (-4)
	NRF treat and maintain	552 (0)	432 (0)
	Dispersal removal	87 (-0.4)	37 (-0.3)

Analysis Area	Effects to Habitat	Pre-fire Proposed Action Acres (% change to baseline)	Post-fire Proposed Action Acres (% change to baseline)
	Dispersal treat and maintain	1,927 (0)	1,664 (0)

Effects to NSO Sites

Table 9 compares pre- and post-fire NRF habitat available in the nest patch, core area and home range of seven known NSO sites in the Action Area. The table also displays the acres of habitat effects expected as a result of implementing the Project Alternative 2. A comparison is made between the effects of Alternative 2 from the consultation vs. the effects of Alternative 2 now modified. Note that some acres affected overlap between the home ranges where treatment units occur within more than one home range. Corrections were made to a couple of home ranges for post-treatment PFF and post-treatment NRF that were incorrectly calculated in the version submitted to the Service. These changes were minor and inconsequential to the final conclusions of the compliance document and letter of concurrence.

Post-fire habitat affected by the proposed Alternative 2 for each site would be less than that covered by the consultation. NRF and dispersal removal for landing construction within home ranges and core areas included in the consultation is expected to be less due to fewer acres that will be commercially thinned and more opportunities to use existing openings due to fire suppression activities. Any new landings would be included within the 20% of allowable openings per unit.

Sites 55, 60 and Sam Brown would have dispersal removed for meadow restoration within less than 1 percent their home ranges for meadow restoration, which would also affect less than 1 percent of the core areas for sites 60 and Sam Brown. This impact is less extensive than that in the consultation.

Downgrade of NRF within all of the home ranges outside of the core area and nest patch was also included in the consultation. The proposed reduction would not affect the percent NRF within three home ranges (50, 59, 60) and would result in a 1 percent NRF reduction in two home ranges (55 and 228). Sam Brown would experience a 2 percent reduction, resulting in 35 percent NRF where it would have been at 38 percent post-treatment prior to the fire. Secret Creek would experience a 2 percent reduction, resulting in 27 percent NRF, where it would have been at 39 percent prior to the fire.

There would be no NRF downgrade in core areas. Dispersal would be reduced for meadow restoration in the core area for sites 55 (2 ac) and Sam Brown (2 ac). A total of 134 acres of NRF and 336 acres of dispersal would be treated and maintained across five of the core areas. Pre-fire acres consulted on were 152 NRF and 388 dispersal treat and maintain across the same five core areas.

In summary, the 2018 fires reduced NRF levels within core areas, and home ranges below what they were in the consultation and all are now below threshold levels of NRF associated with NSO reproductive success. Proposed NRF downgrade would result in slightly lower NRF percentages (1-2 percent lower) within four home ranges (55, 228, Sam Brown and Secret Creek). This downgrade is associated with sites that have low relative habitat suitability such and treatments are focused on maintenance of pine/oak habitat or establishment of ridgeline fire management zones. This percent change in NRF for these home ranges is the same or lower than what was consulted on prior to the fires and is displayed in Table 11. In addition, treatments that maintain dispersal habitat outside of the FMZs and pine/oak habitats in these home ranges are expected to develop future NRF habitat because they are on sites with higher relative habitat suitability.

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Table 9. Pre- and Post-fire NSO habitat condition and effects of Alternative 2 for sites analyzed in Upper Briggs Project Action Area.

(HR = Home Range, Core (CA) = Core Area, NP = Nest Patch, PFF = post-fire foraging, T&M = treat and maintain.)

1- NRF on federal lands/ percent of habitat within the total home range or core area – acres of NRF / 3400 acres for HR; acres of NRF / 500 acres for CA.

2- Reduced = NRF or Dispersal removed or downgraded from the proposed action. Removal of NRF or dispersal for landings and road construction in the acreage for respective treatments and not double-counted

3- PFF in treated acres may have occasional snags felled and left on-site

Site	Pre-treatment NRF Habitat ¹ acres (%)			Pre-Treatment PFF Habitat acres (%)			NRF Reduced ² acres		PFF in treated acres ³		Dispersal Reduced acres		T&M in Nest Patch acres (%NP)		T&M in Core acres (%CA)		T&M in Home Range Acres (%HR)		Post-Treatment NRF Habitat acres (%)		Post-Treatment PFF acres (%)		Effects Rationale
	HR	Core	NP	HR	Core	NP	HR	Core	HR	Core	HR	Core	NRF	Disp	NRF	Disp	NRF	Disp	HR	Core	HR	Core	
50 Pre-fire	1246 (36)	197 (39)	16 (23)				7	0			0.2	0	0	0	0	0	228 (7)	427 (13)	1239 (36)	197 (39)			7 ac NRF downgrade at edge of HR in small patches within low RHS pine-oak restoration. No change in % NRF, long-term increase in NRF in HR.
50 Post-fire	880 (26)	153 (30)	14 (20)	141 (4)	7 (1)	<1 (0)	6	0	0	0	0	0	0	0	0	0	16 (<1)	51 (1)	874 (26)	153 (30)	141 (4)	7 (1)	6 ac NRF downgrade at edge of HR in small patches within low RHS pine-oak restoration. No change in % NRF, long-term increase in NRF in HR T&M dispersal.
55 Pre-fire	1094 (32)	207 (41)	37 (53)				31	0.5			65	7	4 (6)	6 (9)	42 (8)	151 (30)	189 (6)	690 (20)	1063 (31)	206.5 (41)			31 ac NRF reduction in HR for low RHS pine-oak restoration will decrease NRF by 1% in deficient HR in short term with long-term increase from treat and maintain acres. No change in CA % NRF short-term with long-term increase. Dispersal reduced: HR- 65 ac meadow restoration; CA - 7 ac meadow restoration. Nest Patch TM is along an existing road to be used as a holding line for underburning a pine-oak restoration treatment. Only ladder fuel treatment by

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Site	Pre-treatment NRF Habitat ¹ acres (%)			Pre-Treatment PFF Habitat acres (%)			NRF Reduced ² acres		PFF in treated acres ³		Dispersal Reduced acres		T&M in Nest Patch acres (%NP)		T&M in Core acres (%CA)		T&M in Home Range Acres (%HR)		Post-Treatment NRF Habitat acres (%)		Post-Treatment PFF acres (%)		Effects Rationale
	HR	Core	NP	HR	Core	NP	HR	Core	HR	Core	HR	Core	NRF	Disp	NRF	Disp	NRF	Disp	HR	Core	HR	Core	
55 Post-fire	1040 (31)	164 (33)	36 (51)	23 (1)	5 (1)	0	20	0	7	3	19	2	4 (6)	6 (9)	42 (8)	128 (25)	178 (5)	665 (19)	1020 (30)	164 (33)	23 (1)	5 (1)	<p>20 ac NRF downgrade in HR for low RHS pine-oak and Ridgeline FMZ will decrease NRF by 1% in deficient HR in short term with long-term increase from treat an maintain acres.</p> <p>No change in CA % NRF short-term with long-term increase.</p> <p>Dispersal reduced: HR- 19 ac meadow restoration; CA - 2 ac meadow restoration.</p> <p>Nest Patch TM is along an existing road to be used as a holding line for underburning a pine-oak restoration treatment.</p> <p>Only ladder fuel treatment by hand to safely underburn would occur here.</p>
59 Pre-fire	1356 (40)	200 (40)	38 (54)				2	0			0	0	0	0	0	0	0	0	1354 (40)	200 (40)			<p>2 ac NRF downgrade in low RHS ridgeline at edge of Home Range. No change in % NRF.</p>
59 Post-fire	668 (20)	94 (19)	25 (36)	298 (9)	38 (8)	1 (1)	1	0	0	0	0	0	0	0	0	0	0	0	667 (20)	94 (19)	298 (9)	38 (8)	<p>1 ac NRF downgrade in low RHS ridgeline at edge of Home Range. No change in % NRF.</p> <p>No Change in PFF</p>

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Site	Pre-treatment NRF Habitat ¹ acres (%)			Pre-Treatment PFF Habitat acres (%)			NRF Reduced ² acres		PFF in treated acres ³		Dispersal Reduced acres		T&M in Nest Patch acres (%NP)		T&M in Core acres (%CA)		T&M in Home Range Acres (%HR)		Post-Treatment NRF Habitat acres (%)		Post-Treatment PFF acres (%)		Effects Rationale
	HR	Core	NP	HR	Core	NP	HR	Core	HR	Core	HR	Core	NRF	Disp	NRF	Disp	NRF	Disp	HR	Core	HR	Core	
60 Pre-fire	948 (28)	185 (37)	60 (86)				39	0			6	0	0	0	24 (5)	49 (10)	103 (3)	350 (10)	909 (27)	185 (37)			39 ac NRF reduction in HR on low RHS ridgeline. 1% short-term NRF reduction in deficient HR with long-term increase in HR and CA. 6 ac dispersal removed for meadow restoration at edge of HR.
60 Post-fire	622 (18)	144 (29)	25 (36)	171 (5)	12 (2)	<1	11	0	9	0	2	0	0	0	17 (3)	33 (7)	101 (3)	299 (9)	611 (18)	144 (29)	171 (5)	12 (2)	11 ac NRF reduction in HR on low RHS ridgeline. No change in % NRF. Long-term increase in HR and CA with dispersal T&M. 2 ac dispersal removed for meadow restoration at edge of HR.
228 Pre-fire	1007 (30)	151 (30)	35 (49)				17	0.5			10	2	0	0	9 (2)	52 (10)	64 (2)	369 (11)	990 (29)	150 (30)			17 ac NRF reduced in deficient HR for pine-oak restoration results in 1% NRF reduction. No change in CA %NRF. Long-term increase of NRF at HR and CA with treat and maintain.
228 Post-fire	733 (22)	99 (20)	30 (43)	207 (6)	31 (6)	2 (3)	7	0	2	0	0	0	0	0	9 (2)	50 (10)	67 (2)	358 (10)	726 (21)	98.5 (20)	207 (6)	31 (6)	7 ac NRF reduced in deficient HR for pine-oak restoration results in 1% NRF reduction. Small reduction in HR PFF would not reduce % PFF. No change in CA %NRF. Long-term increase of NRF at HR and CA with treat and maintain.

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Site	Pre-treatment NRF Habitat ¹ acres (%)			Pre-Treatment PFF Habitat acres (%)			NRF Reduced ² acres		PFF in treated acres ³		Dispersal Reduced acres		T&M in Nest Patch acres (%NP)		T&M in Core acres (%CA)		T&M in Home Range Acres (%HR)		Post-Treatment NRF Habitat acres (%)		Post-Treatment PFF acres (%)		Effects Rationale
	HR	Core	NP	HR	Core	NP	HR	Core	HR	Core	HR	Core	NRF	Disp	NRF	Disp	NRF	Disp	HR	Core	HR	Core	
Sam Brown Pre-fire	1356 (40)	251 (50)	38 (54)				72	0.6			54	7	0	0	43 (9)	50 (10)	158 (5)	367 (11)	1284 (38)	250 (50)			72 ac NRF reduction in HR on low RHS ridgeline and pine oak restoration. 2% NRF reduction would move HR below threshold in the short-term. No change in CA %NRF. Long-term increase in NRF in HR and CA. Dispersal reduced for meadow restoration and landing construction.
Sam Brown Post-fire	1245 (37)	231 (46)	36 (51)	29 (1)	<1	<1	62	0	10	0	16	2	0	0	43 (9)	55 (11)	142 (4)	349 (10)	1183 (35)	231 (46)	29 (1)	<1	62 ac NRF downgrade in deficient HR on low RHS ridgeline and pine oak restoration results in 2% NRF reduction. No change in CA %NRF. Long-term increase in NRF in HR and CA. Dispersal reduced for meadow restoration.
Secret Creek Pre-fire	1488 (44)	185 (37)	43 (61)				175	0.5			5	1	0	4 (6)	34 (7)	86 (17)	185 (5)	440 (13)	1313 (39)	184 (37)			175 ac NRF reduction would occur in low RHS ridgeline FMZ and for pine-oak restoration. These acres are spread out at the edges of the Home Range. 5% NRF reduction would move HR 1% below threshold in the short term with long term increase from TM acres.
Secret Creek Post-fire	989 (29)	155 (31)	41 (59)	222 (6)	4 (1)	0	65	0	63	0	0	0	0	4 (6)	23 (5)	70 (14)	124 (4)	396 (12)	924 (27)	155 (31)	222 (6)	4 (1)	65 ac NRF downgrade would occur in low RHS ridgeline FMZ and for pine-oak restoration in deficient HR resulting in 2% reduction of NRF. These acres are spread out at the edges of the Home Range. No reduction in CA NRF. Long term NRF increase from TM acres.

Effects to prey

Effects of the fires likely shifted prey species abundance and composition throughout the action area depending on the fire severity and pre-fire habitat structure. For instance, suitable habitat for red tree voles and flying squirrels is likely reduced where fire effects resulted in large tree and canopy loss. Conversely, post-fire response of herbaceous vegetation, shrubs and re-sprouting hardwoods, and newly-created edges may increase populations of prey species such as mice and woodrats.

Fontaine (2008) found that just after the 2002 Biscuit Fire (directly adjacent to the Upper Briggs watershed), small mammal communities transitioned from low abundance and high species richness to high abundance and low species richness, largely dominated by deer mice. Partial recovery to pre-fire conditions was observed at about 17 years after the fire with wood rats being present but vole species still absent relative to unburned mature forest. Zwolack and Foresman (2007) found varying degrees of response to stand replacement fire in their study with a large negative response from red back voles, a relatively common prey item for spotted owl. Zwolack and Foresman (2007) also found that relatively rare species such as northern flying squirrels and bushy-tailed woodrats were largely restricted to unburned areas in severely burned landscapes. Flying squirrels are generally most abundant in older, multi-storied forests with large trees and snags and relatively abundant down wood and fungi. They can also be found in in younger, relatively dense commercial-aged stands. Stand replacement fire would likely remove this species from those areas and even on lower severity fire, if there is a loss of the middle stand layer where they could be impacted by predators (Wilson 2010). Nevertheless, some of these stands may still provide low-moderate quality habitats for flying squirrels where they burned at low intensity.

The action area provides habitats for both bushy-tailed woodrats (*Neotoma cinerea*) and dusky-footed woodrats (*N. fuscipes*). Both of these species use small-diameter woody material for building nests which may be constructed either on the ground or in trees. Both species also forage on shrubs, forbs, grasses, and parts of conifers. Lee and Tietje (2005) concluded that a low-medium intensity prescribed understory fire had no negative effect on the survival or temporary emigration on dusky-footed woodrats in San Luis Obispo County, California and that prescribed understory fire in oak woodland is unlikely to alter woodrat populations significantly if patches of well-distributed habitats are maintained. Fire can increase the abundance of shrubby vegetation used by woodrats (along with mice and vole species). Edge ecotones created from fire can be areas of increased woodrat abundance and exposure to foraging NSOs (Zabel et al.1995). However, high severity fire is likely to remove habitat for woodrats, at least in the short term (D. Clayton per obs).

The effects to prey from proposed alternative 2 would remain the same as analyzed in the Project BA, however the extent of impacts would be less with fewer acres treated. Treatment implementation would be spread out temporally and spatially within the Action Area which would reduce the short-term negative effects from habitat disturbance or reduction due to thinning. Long-term effects of habitat reduction in ridgeline FMZs would remain the same, however less NRF habitat would be downgraded and maintenance with prescribed fire would not all occur at the same time.

Effects to designated critical habitat

The biological assessment prepared for this project determined that implementation of alternative 2 would be likely to adversely affect critical habitat subunit K LW2 for the northern spotted owl due to downgrade of NRF in ridgeline FMZ and pine oak treatments and removal of dispersal habitat for meadow restoration.

Table 10 shows that the degree of loss of NRF within the entire subunit from implementation of alternative 2 would be slightly higher than pre-fire effects, but still very small (< 1%) at the scale of the subunit. The degree of dispersal habitat removed would be less than the pre-fire effects.

Table 10. Effects to NSO Critical Habitat from the Proposed Action

	NRF Removed (acres)	NRF Downgrade (acres)	NRF T&M (acres)	PFF (acres)	Dispersal-Only Removed (acres)	Dispersal-Only T&M (acres)	Total Habitat Acres Treated
KLW-2 (Pre-fire baseline acres)	91,442				36,709		
Proposed Action acres (Pre-fire)	15.5	509	535		87	1,790	2,900¹
% Change to KLW-2 Baseline Habitat (Pre-Fire)	< - 0.02%	-0.5%	No Change		- 0.2%	No Change	
KLW-2 (Post-fire baseline acres)	52,549			4,519	46,465		
Proposed Action acres (Post-fire)	15.5	350	421	94	37	1,534	2,342¹ (not including PFF)
% Change to KLW-2 Baseline Habitat (Post-Fire)	< -0.03%	-0.7%	No Change		-0.08%	No Change	

¹ Acres of NRF and dispersal-only removed for road and landing construction are also included in downgrade and TM acres

The 500-acre analysis recommended in the 2012 Final CHU rule (77 *Federal Register* 46:14062-14165) to evaluate localized effects to CHU was updated with the post-fire habitat and proposed action. To conduct this recommended analysis within critical habitat boundaries, a 500-acre (0.5-mile radius) buffer around centroids of proposed treatment units that would remove or downgrade NRF or dispersal only habitat were delineated. Acres of pre-and post-treatment NRF habitat in the 500-acre analysis areas were compared to determine effects to primary constituent elements and primary biological features of critical habitat. Tables 11 and 12 compare the pre- and post-fire analysis.

Table 11. Pre-fire: Pre- and Post-Treatment NRF Habitat on NF lands within 500-acre CHU Analysis Areas

CHU Subunit	NRF Pre-Treatment (acres)	NRF Reduced (acres)	NRF Post-Treatment (acres)	Percent Change
KLW-2	3,073	500	2,573	-16%
	Total Dispersal Pre-Treatment	Dispersal-only Reduced¹	Total Dispersal Post-Treatment	
	6,471	63	6,408	-1%

¹ Does not include landing/tmp road construction

Table 12. Post-fire: Pre- and Post-Treatment NRF Habitat on NF lands within 500-acre CHU Analysis Areas

CHU Subunit	NRF Pre-Treatment (acres)	NRF Reduced (acres)	NRF Post-Treatment (acres)	Percent Change
KLW-2	2,537	344	2,193	-13%
	Total Dispersal Pre-Treatment	Dispersal-only Reduced¹	Total Dispersal Post-Treatment	
	2,876	15	2,861	-0.5%

¹ Does not include landing/tmp road construction

The post-fire analysis in Table 12 shows measurable localized effects of NRF downgrade and dispersal-only removal associated with the Upper Briggs Project in subunit KLW-2. The percent change would be lower than what was included in the Project consultation.

Cumulative Effects to Northern Spotted Owl and Designated Critical Habitat

The private lands which comprise 2 percent of the Upper Briggs Creek watershed are not considered to contribute long-term owl habitat in the watershed. Treatment of up to 500 acres of plantations throughout the watershed (covered by separate NEPA and consultation) and adjacent to proposed units may occur concurrently with proposed Upper Briggs treatments (e.g. underburning). These plantations are either non-habitat for owls or dispersal that would continue to function as dispersal habitat post-treatment. The same restrictions to avoid disturbance to owls during the critical breeding season would be applied to these activities. It is desirable to treat these young stands to promote their development into suitable dispersal or NRF habitat for owls.

As described previously, fire effects and suppression activities have reduced suitable NSO habitat within sites and designated critical habitat that overlap the proposed action treatment areas. Treatments proposed under alternative 2 have been reduced where fire and suppression effects have eliminated the need to treat in order to achieve desired objectives. The direct and indirect effects of proposed treatments that would downgrade NRF and remove dispersal under alternative 2 may be additive to cumulative effects to NSO and critical habitat, though the degree of effects would be less than what was expected from the proposed action prior to the fires as displayed in the tables above.

There would be no accumulation of disturbance effects to owls during the critical breeding season with other activities such as recreation and mining, because seasonal restrictions to eliminate project-related noise and smoke disturbance would be implemented.

Pacific fisher – R6 Sensitive, Proposed for Federal Listing

The analysis area for Pacific fisher is the same as the 31,525-acre Action Area evaluated for the northern spotted owl.

Fisher habitat consists of mature and late-successional coniferous and mixed forests. Large dead wood (both standing and down) are key components, which are used for denning and resting. The best predictor of fisher occurrence is moderate to high amounts of contiguous canopy cover (Lofroth and others, 2010). The fisher has been described as one of the most habitat-specialized mammals in western North America (Buskirk and Powell 1994); however, more recent research has shown that specialization appears to be tied primarily to patches or stands of mature and older forests with complex structures for denning and resting habitats. The varied diet of fishers suggests they may forage in a broader range of forested habitats.

Fisher sightings are documented in the Forest NRIS database within 5 miles north and south of the Upper Briggs Creek sixth-field watershed. The abundance of mixed conifer-hardwood habitat in the watershed including black and white oak and the proximity of sightings suggests fishers are likely to occur within the project area. Furnas et al (2017) estimates that there are up to 139 individuals in Josephine County using density estimates. These data estimate up to 5.4 individuals per 101/km² in the watershed, which is about 7 individuals in the 126 km² action area.

Direct and Indirect Effects of the Proposed Action

Effects to the fisher from the proposed action could include removal of habitats, denning and resting structures, potential impacts to dispersal, and disturbance impacts.

Effects to Habitat

Direct impacts to fisher habitat could be the removal or reduction of closed canopy habitat and possible removal of trees with mistletoe that may provide denning/resting habitat which may occur within any of the proposed units. Fisher are relatively resilient to commercial and non-commercial fuels work in the Ashland watershed that is similar to proposed Upper Briggs

treatments (Clayton Pers. Obs). Treatments designed to increase stand development, maintain habitat diversity and lower fire risk such as variable density thinning and prescribed burning may ultimately improve suitability of habitat for the fisher and may be essential to reducing loss of suitable habitat to wildfire. However, short-term impacts may include reduction of important habitat features such as canopy cover, and potential rest and denning structures including snags and logs. Furthermore, treatments that could take place in the spring would coincide with the west coast fisher breeding season, and thus may impact natal dens or displace fisher from areas used for breeding.

Effects to Denning and Resting habitats

Denning and resting habitats can be affected by the proposed action where canopy cover may be reduced below 60 percent (374 acres) and possible removal of trees with mistletoe which could occur within approximately 2,507 total acres, which is 10 percent of the 24,386 acres of closed-canopy and spotted owl dispersal habitat that potentially provide potential fisher denning/resting/foraging habitats in the AA. Removal of these structures particularly during the denning season which is generally from mid-March to June, could lead to direct impacts to denning fisher and their young. The retention of hardwoods in treatment areas and treatments designed to enhance hardwood growth would promote fisher denning habitat in the watershed.

Effects to Dispersal Habitats

At the scope of landscape dispersal habitat for fisher, proposed treatments distributed across a total of 4,017 acres (16 percent) of the Upper Briggs sixth-field watershed are not likely to appreciably impact fisher dispersal. All treatments would maintain at least 40 percent canopy cover except 15 acres of conifer removal for meadow restoration distributed among three meadows in the watershed.

Effects from disturbance

Little is known how fisher respond to vegetation management activities, and effects from motorized vehicles showed no impact to fisher in the Sierras (USDI Fish and Wildlife Service 2016) which may have been due to the lack of access into fisher habitats. In a study in the southern sierras, burning within a den stand caused the female to move her kits the day after the burn was conducted and levels of CO₂ were elevated within the den itself which could impact kits (Thompson and Purcell 2016.). In the Ashland watershed, fisher showed marked responses to different levels of disturbance; fisher moved up to 800 meters during helicopter operations, while several successful den sites were within 100-200 meters of high use roads where log hauling was occurring. Other fishers in rest sites seemed to tolerate cutting crews conducting work within 100 meters (D. Clayton Pers. Obs). In the Ashland Forest Resiliency project, activities were limited during the early breeding season (March to June) within 400 feet of known and occupied dens with no apparent response or adverse effect to the female of kits. Given the lack of any definitive data on disturbance distances, a fisher den located within a treatment area could be impacted by certain proposed activities if conducted during the breeding season (March-mid-June). Since we do not know if any given treatment unit is occupied by denning fisher, *a restriction on thinning, yarding and burning activities is recommended from March 1 through June 30 which coincides with northern spotted owl critical breeding season restrictions.* A survey protocol for detecting dens is currently in development, and may provide an option to lift this restriction if these surveys are implemented.

Cumulative Effects

Treatment of up to 500 acres of plantations throughout the watershed (covered by separate NEPA and consultation) and adjacent to proposed units may occur concurrently with proposed Upper Briggs treatments (e.g. underburning). These plantations may provide foraging or dispersal habitat that would continue to function as such post-treatment. It is desirable to treat these young stands to promote their development into resilient, mature forested stands. These

activities would be subject to the same restrictions on thinning, yarding and burning activities between March 1 and June 30 as described above.

Non-federal lands represent 1% of the action area, which is private or industrial timberland. Management practices occurring on private lands range from residential home site development to industrial timber management. The majority of state and private forests in Washington, Oregon, and Northern California are managed for timber production. Historically, non-federal landowners practiced even-aged management (clear-cutting) of timber over extensive acreages. Private industrial forestlands are managed for timber production and will typically be harvested between 40 and 60 years of age, in accordance with State Forest Practices Act Standards. The RRSNF and the Medford BLM assume past management practices on private lands will continue and do not track private land harvest activity. Activities on non-federal lands do have the potential to impact fisher from disturbance.

The effects of proposed activities may be additive to impacts of other past, present, and reasonably foreseeable future actions on the small amount of non-federal lands in the watershed that would result in cumulative negative impacts to fisher.

Conclusion

Existing habitat for fisher could be negatively impacted with the implementation of the proposed activities from vegetation modification within 10 percent of potential habitat in the action area and may be additive to cumulative negative effects. Long-term effects of treatments are expected to benefit fisher by increasing resilience of suitable habitat to extreme disturbances such as drought and fire, and promoting growth of hardwoods. Effects from project-related disturbance could be largely mitigated through application of timing restrictions and other conservation measures such as retaining potential denning structures. However, if disturbance minimization PDCs are not followed the proposed actions could cause abandonment of one or more fisher dens in any given year. Implementation of proposed activities **May Impact Individuals and or Habitat, but not likely contribute towards a trend to federal listing or a loss of viability to the population or species for Pacific fisher**

Recommended PDC Burning, cutting, yarding, and other activities during the denning season could affect fisher by disturbance. Avoid these activities from March 1 through June 30.

Other Species of Concern

Migratory and Focal Bird Species

Table 13 (Table 10 from the Project Wildlife Report and Biological Evaluation) lists the species of concern and focal species associated with habitat that occurs within the Upper Briggs project.

Table 13. Migratory bird species of concern and associated habitat attributes within the Upper Briggs project area.

Forest Condition	Habitat Attribute	Focal Species
Old-growth/Mature	Large snags	Pileated Woodpecker
Old-growth/Mature	Large trees	Brown Creeper
Old-Growth/Mature	Deciduous canopy trees	Pacific-slope Flycatcher
Old Growth-Mature	Mid-story tree layers	Varied Thrush
Mature	Conifer-deciduous canopy	Northern goshawk
Mature	Large patches of moist conifer forest	Chestnut-backed chickadee
Mature/Young	Closed canopy	Hermit/Townsend's Warbler
Mature/Young	Open mid-story	Hammond's Flycatcher
Mature/Young	Deciduous understory	Wilson's Warbler
Mature/Young	Forest floor complexity	Winter Wren

Young/Pole	Deciduous canopy trees	Black-throated Gray Warbler
Young/Shrub	Open shrub dominated	Mountain quail
Young/Shrub	Dense brush/young plantations	Wrentit
Sapling/Seedling	Residual canopy tree	Olive-sided Flycatcher
Sapling/Seedling	Snags	Northern Flicker
Sapling/Seedling	Deciduous vegetation	Orange-crowned Warbler
Unique	Nectar-producing plants	Rufous Hummingbird
Unique	Mineral springs/seeps	Band-tailed Pigeon
Unique	Montane wet meadows	Lincoln's Sparrow
Unique	Large hollow snags	Vaux's Swift
Unique	Landscape mosaic forest	Blue (Sooty) Grouse
Klamath Mts. Mixed Forest	Pine-oak canopy/subcanopy trees	Purple Finch
Klamath Mts. Mixed Forest	Dense shrub understory	Nashville Warbler
Klamath Mts. Mixed Forest	Shrub-herbaceous interspersions	Hermit Thrush
Klamath Mts. Mixed Forest	Forest canopy edges	Western Tanager
Klamath Mts. Mixed Forest	Montane brushfields	Fox Sparrow
Klamath Mts. Mixed Forest	Post-fire	Lazuli Bunting
Conifer Hardwood Forest	Mixed conifer and hardwoods	Pine siskin
Conifer Forest Edge	Forest edge/shrub openings	Evening grosbeak
Forest Edge/Riparian	Dense, moist vegetation	Allen's hummingbird
Edge/Riparian	Dense riparian shrubs (willow)	Willow Flycatcher

The fires changed the distribution of habitats used by migratory birds within at least 50 percent of the sixth-field watershed. As discussed for the MIS species, forested habitats of all ages were reduced while early seral habitats have increased. Meadows are expected to recover in the next growing season. Areas of dense brush will take longer to fill in, however increased brushy habitat, deciduous vegetation and forest edge is expected to be available for a few decades until tree cover is re-established. In addition, snag habitat has increased.

PDCs to protect migratory bird nests would be implemented. Given reduction of treatment acres and delays in prescribed fire, the effects of the Project to migratory birds would be the same as previously analyzed, but to a lesser degree. Therefore, no further analysis is needed.

Pollinators

The best pollinator habitat consists of open landscapes with good sun exposure and many types of native, herbaceous plants (Xerces Society for Invertebrate Conservation 2015). One key is having a variety of plants that produce pollen and nectar from spring through early fall. The response of flowering plants following the 2018 fires is expected to increase the availability of nectar and pollen throughout the areas that burned and are now open to sunlight. This was observed following the Chetco Bar fire especially in spring to mid-summer.

With an expected increase in pollinator habitat from the fires and less soil disturbance from reduced treatment acres, there would be no change in the expected effects of the Project to pollinators from what was previously analyzed and no further analysis is necessary.

References

Buskirk, S.W. and R.A. Powell. 1994. Habitat ecology of fishers and American martens. Pages 283-296 in S.W. Buskirk, A.S. Harestad, M.G. Raphael, and R.A. Powell, editors. Martens, sables, and fishers: biology and conservation. Cornell University Press, Ithaca, New York, USA.

Courtney, S.P.; Blakesley, J.A.; Bigley, R.E. [and others]. 2004. Scientific evaluation of the status of the northern spotted owl. Portland, OR: Sustainable Ecosystem Institute.

Davis, R.J.; Hollen, B.; Hobson, J. J.E. Gower, D. Keenum. 2016. Northwest Forest Plan - the first 20 years (1994-2013): status and trends of northern spotted owl habitats. Gen. Tech. Rep. PNW-GTR-929. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 54p.

Davis, R.J.; McCorkle, D.; Ross, D. 2011. Survey protocol for Johnson's hairstreak butterfly (*Callophrys johnsoni*) in Washington and Oregon, (v. 1.2). Available online at <https://www.fs.fed.us/r6/sfpnw/issssp/inventories/monitoring.shtml>

Dugger, K.M.; Forsman, E.D.; Davis, R.J.; Franklin, A.B., [et al.]. 2015. Long-term population demographics of northern spotted owls: 20 years after adoption of the NWFP. Slides from a presentation made at the public forum for sharing key findings of the Northwest Forest Plan 20-year monitoring reports. June 9, 2015. Vancouver, Washington. <http://www.reo.gov/monitoring/reports/20yr-report/>. (July 21).

Fontaine, J. B. (2008). Influences of high severity fire and postfire logging on avian and small mammal communities of the Siskiyou Mountains, Oregon, USA (Order No. 3295620). Available from Natural Science Collection. (304510682).

Forsman, E.D.; Horn, K.M.; Neitro, W.L. 1982. Spotted owl research and management in the Pacific Northwest. In: North American Wildlife and Natural Resources Conference. 323-331 p.

Furnas, B. J., R. H. Landers, R. L. Callas, and S. M. Matthews. 2017. Estimating population size of fishers (*Pekania pennanti*) using camera stations and auxiliary data on home range size. Ecosphere 8(3):e01747. 10.1002/ecs2.1747

Gaines, W.L.; Lyons, A.L.; Weaver, K.; Sprague, A. 2011. Monitoring the short-term effects of prescribed fire on an endemic mollusk in the dry forests of the eastern Cascades, Washington, USA. Forest Ecology and Management. 261(2011): 1460-1465.

Huff, R. 2016. High Priority Site Management Recommendations for the Red Tree Vole (*Arborimus longicaudus*) Version 1.0, April 2016. Portland, OR: USDI Bureau of Land Management Oregon/Washington, USDA Forest Service Region 5 and 6. 45 p.

Huff, R.; Van Norman, K.; Hughes, C. [and others]. 2012. Survey protocol for the red tree vole, Version 3.0. Portland, OR: USDA Forest Service Region 5 and 6, USDI Bureau of Land Management Oregon/Washington. 52p.

Jones, G.M.; Gutierrez R.J.; Tempel D.J.; Whitmore S.A.; Berigan W.J.; Peery M.Z. 2016. Megafires: an emerging threat to old-forest species. Front. Ecol. Environ 2016:14(6) 300-306, doi:10.1002/fee.1298

Knapp, E.E.; Estes, B.L.; Skinner, C.N. 2009. Ecological effects of prescribed fire season: a

literature review and synthesis for managers. Gen. Tech. Rep. PSW-GTR-224. Albany, CA: USDA Forest Service, Pacific Southwest Research Station. 80.

Lee, D., Tietje, W. 2005. Dusky footed woodrat demography and prescribed fire in a California Oak Woodland. Department of Environmental Science, Policy, and Management, University of California, Berkeley, CA 94720, USA

Lofroth, E. C.; Higley, J. M.; Naney, R. H. [and others]. 2010. Conservation of fishers (*Martes pennanti*) in south-central British Columbia, western Washington, western Oregon, and California - Volume I: Conservation assessment. 3 vols. Vol. 1. Denver, CO: USDI Bureau of Land Management.

Mellen-McLean, K.; Marcot, B.G.; Ohmann, J.L. [and others]. 2012. DecAID, the decayed wood advisor for managing snags, partially dead trees, and down wood for biodiversity in forests of Washington and Oregon. v. 2.20. Portland, OR: USDA Forest Service, Pacific Northwest Region and Pacific Northwest Research Station; USDI Fish and Wildlife Service, Oregon State Office. <http://www.fs.fed.us/r6/nr/wildlife/decayid/>

Metlen, K; Borgias, D.; Skinner, C. 2016. Historical Fire Frequency in the Rogue Basin. Published as an appendix in: Thorpe, D. 2016 Boot Prints: A centennial summary of activities and events of Oregon's Department of Forestry in Jackson and Josephine Counties. Oregon Department of Forestry Southwest Oregon District, Central Point, OR.

Rockweit, J.T.; Franklin, A.B.; Carlson, P.C. 2017. Differential impacts of wildfire on the population dynamics of an old-forest species. In press. doi: 10.1002/ecy.1805

Sakai, H.F.; Noon, B.R. 1993. Dusky-footed woodrat abundance in different aged forests in northwestern California. *Journal of Wildlife Management* 57:373–382.

Sakai, H.F.; Noon, B.R. 1997. Between-habitat movement of dusky-footed woodrats and vulnerability to predation. *Journal of Wildlife Management* 61(2):343-350.

Sollmann, R.; White, A.M.; Rarbill, G.L.; Manley, P.N.; Knapp, E.E. 2016. Landscape heterogeneity compensates for fuel reduction treatment effects on northern flying squirrel populations. *Forest Ecology and Management* 373 (2016): 100-107.

Smith, J.E.; McKay, D.; Niwa, C.G.; Thies, W.G.; Brenner, G.; Spatafora, J.W. 2004. Short-term effects of seasonal prescribed burning on the ectomycorrhizal fungal community and fine root biomass in ponderosa pine stands in the Blue Mountains of Oregon. *Can. J. For. Res.* Vol 34: 2477-2491.

Spies, T.A.; Hemstrom, M.A.; Youngblood, A.; Hummel, S. 2006. Conserving old-growth forest diversity in disturbance-prone landscapes. *Conservation Biology* Volume 20, No. 2, 351-362.

Tempel, D.J.; Gutierrez, R.J.; Battles, J.J.; Fry, D.L.; Su, Y.; Guo, Q.; Reetz, M.J.; Whitmore, S.A.; Jones, G.M.; Collins, B.M.; Stephens, S.L.; Kelly, M.; Berigan, W. J.; Peery, M. Z. 2015. Evaluating short- and long-term impacts of fuels treatments and simulated wildfire on an old-forest species. *Ecosphere*: Dec. 2015, Vol. 6(12) Article 261

Thomas, J.W.; Forsman, E.D.; Lint, J.B. [and others]. 1990. A conservation strategy for the northern spotted owl. Portland, OR: USDA Forest Service; USDI Bureau of Land Management; USDI Fish and Wildlife Service; USDI National Park Service. 427 p.

Thompson, C.M.; Purcell, K.L. 2016. Conditions inside fisher dens during prescribed fires; what is the risk posed by spring underburns? *Forest Ecology and Management*. 359: 156-161. DOI:

10.1016/j.foreco.2015.10.003.

Trappe, M.J.; Cromack Jr. K.; Trappe, J.M.; Perrakis, D.D.B.; Cazares-Gonzales, E.; Castellano, M.A.; Miller, S.L. 2009. Interactions among prescribed fire, soil attributes, and mycorrhizal community structure at Crater Lake National Park, Oregon USA. *Fire Ecology*, Vol 5, No. 2. 2009.

USDA Forest Service. 1989. Land and Resource Management Plan - Siskiyou National Forest. Portland, OR: USDA Forest Service, Pacific Northwest Region.

USDA Forest Service. 2012. Siskiyou National Forest MIS forest-wide environmental baseline and species account. Medford, OR: USDA Forest Service, Rogue River-Siskiyou National Forest.

USDA Forest Service; USDI Bureau of Land Management. 1994. [Northwest Forest Plan] Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl [and] standards and guidelines for management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. 1 vols. Portland, OR.

USDA Forest Service; USDI Bureau of Land Management. 2001. Record of decision and standards and guidelines for amendments to the survey and manage, protection buffer, and other mitigation measures standards and guidelines. Vol. 1. Portland, OR.

USDI Fish and Wildlife Service. 1990. Endangered and threatened wildlife and plants; determination of threatened status for the northern spotted owl. Final rule. Federal Register: 55:26114-26194.

USDI Fish and Wildlife Service. 2011a. Endangered and threatened wildlife and plants; revised critical habitat for the marbled murrelet. Final rule. Federal Register 76:61599-61621.
<http://www.gpo.gov/fdsys/pkg/FR-2011-10-05/pdf/2011-25583.pdf>

USDI Fish and Wildlife Service. 2011b. Revised recovery plan for the northern spotted owl (*Strix occidentalis caurina*). Portland, OR: USDI Fish and Wildlife Service. XVI + 258p.

USDI Fish and Wildlife Service. 2012a. Endangered and threatened wildlife and plants; designation of revised critical habitat for the northern spotted owl. Final rule. Federal Register 77:71875-72068.
<http://www.gpo.gov/fdsys/pkg/FR-2012-12-04/pdf/2012-28714.pdf>

USDI Fish and Wildlife Service. 2012b. Protocol for surveying proposed management activities that may impact northern spotted owls. Revised January 9, 2012. Portland, OR: USDI Fish and Wildlife Service. 42 p.

USDI Fish and Wildlife Service. 2015. Coastal Oregon and Northern Coastal California Populations of the Pacific Marten (*Martes caurina*) Species Report. USDI Fish and Wildlife Service. April 2015. 143 pp.

USDI Fish and Wildlife Service. 2018. Species Status Assessment for the Coastal Marten (*Martes caurina*) Version 2.0. USDI Fish and Wildlife Service Region 8, Arcata, CA. July 2018. 141 pp.

Ward, J.P., R.J. Gutierrez, B.R. Noon. 1998. Habitat selection by northern spotted owls: the consequences of prey selection and distribution. *The Condor*. 100:79-92

Waters, J. R., K. S. McKelvey, C. J. Zabel and D. Luoma. 2000. Northern flying squirrel mycophagy and truffle production in fir forests in northeastern California. USDA Forest Service Gen. Tech. Rep. PSW-GTR-178. Albany, CA: USDA Forest Service, Pacific Southwest Research Station.

Wilson, T. 2010. Limiting factors for northern flying squirrels in the Pacific Northwest: A spatial-

temporal analysis. PhD. Thesis. Union Institute and University, Cincinnati, OH.

Wilson, T.M.; Forsman, E.D. 2013. Thinning effects on spotted owl prey and other forest-dwelling small mammals. In: Anderson, P.D.; Ronnenberg, K.L., eds. Density management for the 21st Century: west side story. Gen. Tech. Rep. PNW-GTR-880. Portland, OR: USDA Forest Service, Pacific Northwest Research Station: 79-90.

Xerces Society for Invertebrate Conservation. 2015. Pollinator-friendly best management practices for Federal lands. DRAFT May 11, 2015. Portland, OR: Xerces Society for Invertebrate Conservation. 52 p.

Zabel, C.J., K. McKelvey, and J.P. Ward. 1995. Influence of primary prey on home range size and habitat use patterns of northern spotted owls (*Strix occidentalis caurina*). Canadian Journal of Zoology 73:433-439.

Zielinski, W.J.; Kuceral, T.E. 1995. American marten, fisher, lynx, and wolverine: survey methods for their detection. Gen. Tech. Rep. PSW-GTR-157. Albany, CA: USDA Forest Service, Pacific Southwest Research Station.

Zwolak, R.; Foresman, K.R. 2007. Effects of a stand-replacing fire on small-mammal communities in montane forest. Canadian Journal of Zoology. 85(2007): 815-822.

Appendix A – Mitigation measures and project design criteria

Species	Wildlife Design and Mitigation Measure	Objective	Where Applicable
NSO	Treatment timing of any commercial thinning for certain units are to be staggered over at least two years to minimize effects to prey base for particular known NSO sites, see project Biological Opinion Terms and Conditions (p 64) for more details.	Minimize adverse impacts to federally listed species (spotted owls).	Units: 8, 9, 12, 12A, 262, 504, 505, 3, 3S, 14, 15, 16, 23B, 23C, 31 31A, 31B, 63, 64, 69, 70, 80, 101
NSO	Unit specific treatments for units 101 (entire) and 31B between Secret Creek and road 2500643 – underburn only, minimize ignition, hand thinning may occur to reduce ladder fuels where needed to prevent crown fire. No construction of landings or temp roads in these areas.	Minimize adverse impacts to federally listed species (spotted owls).	Units 101 and 31B
NSO	Nest patches (70 acres) –commercial thinning or temporary road or landing construction will not occur within any NSO nest patches.	Minimize adverse impacts to federally listed species (spotted owls).	All treatment units.
NSO	High Quality NRF (RA32) – no treatment activities will occur in patches identified as high-quality NRF per recovery plan RA32 implementation guidance.	Maintain habitat for federally listed species (spotted owl dispersal habitat).	
NSO	Gaps - Created forest openings will be 3/4 acre or smaller. Gap acreage will not exceed 20% of the unit area inclusive of landings, roads, yarding corridors and other operational openings.	Maintain habitat for federally listed species (spotted owl dispersal habitat).	All treatment units.
NSO	Noise above ambient (chain saws, felling, yarding, road construction, heavy equipment) within disturbance distances - Work activities (tree felling, yarding, road construction, etc.) that produce loud noises above ambient levels will not occur within restricted distances of any spotted owl nest site or unsurveyed NRF habitat between 1 March and 30 June (or until two weeks after the fledging period) – unless protocol surveys have determined the nest site or habitat not occupied, non-nesting, or failed in nesting attempt. Buffer distance for chain saws is 65 yards; for heavy equipment is 35 yards).	Minimize adverse impacts to federally listed species (spotted owls).	All project activities within disturbance distances of NRF habitat.
NSO	Helicopter or blasting operations - Follow the project design criteria in the relevant biological assessment.	Minimize adverse impacts to federally listed species (NSO).	Area of disturbance.
NSO	Hauling on roads not generally used by the public (usually ML 1 & 2) and within 65 yards of an owl nest site or unsurveyed NRF habitat– is restricted from 1 March through 30 June (or as determined by a wildlife biologist).	Minimize adverse impacts to federally listed species (spotted owls).	Haul on ML 1 & 2 roads (typically) and within 65 yards of an owl nest site.
NSO	Danger trees along roads - Limit number of trees to be felled within spotted owl habitat (NRF or dispersal) to no more than 10 trees per road mile. Limit number of trees to be felled within owl nest patch to no more than 5 trees per known nest site.	Maintain habitat for federally listed species (spotted owl)	Haul routes

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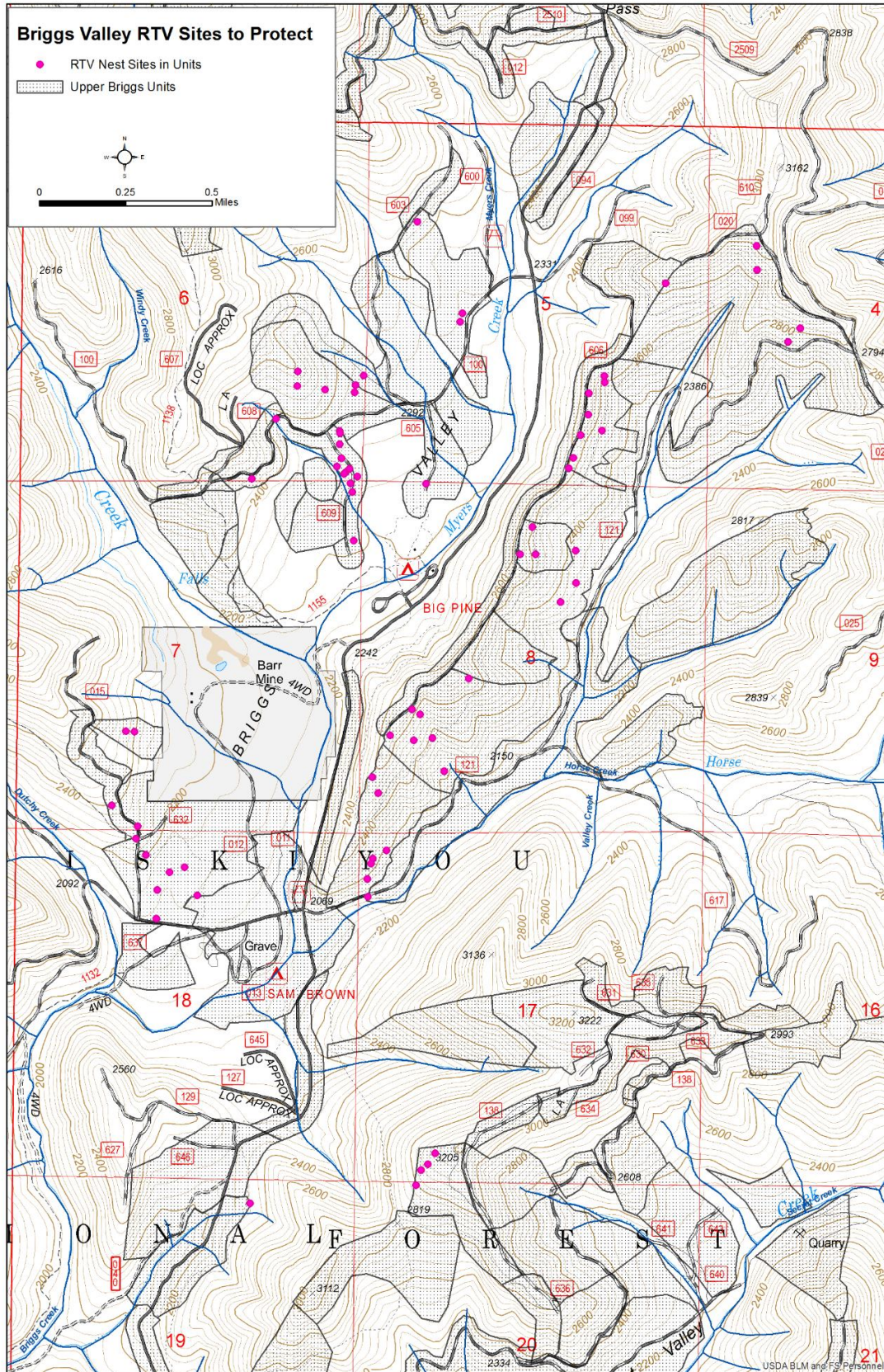
NSO	Burning will not take place within 1/4 mile of a spotted owl site or unsurveyed NRF habitat between 1 March and 30 June (or until two weeks after the fledging period) unless substantial smoke will not drift into the NRF habitat or protocol surveys have determined the habitat is not occupied, or a known site is non-nesting, or failed in their nesting attempt.	Minimize adverse impacts to federally listed species (spotted owls).	All treatment areas.
NSO	If new NSO occupied sites are found during implementation , notify the district biologist and contract officer to implement work stoppage and further evaluation to ensure compliance with consultation (See project BA p 25).	Minimize adverse impacts to federally listed species (spotted owls).	All treatment areas.
Pacific fisher	A timing restriction on thinning, yarding and burning activities is recommended from March 1 through June 30, unless protocols are implemented to determine that fishers are not denning in any given unit.	Minimize adverse impacts to federally proposed species	All treatment areas.
RTV	Red tree vole nest trees outside of high priority sites - Do not cut known nest trees (see map next page) and avoid isolating the nest tree canopy from adjacent tree canopy.	Minimize adverse impacts to red tree voles.	Units 2,3,4,6,9,10,15,16, 23b,48, 253,504,505,508 652
Early seral	Seed landings, decommissioned roads, meadows and other openings with appropriate native grasses, forbs and shrubs to benefit pollinators, ungulates and other early-seral species.	Provide for species dependent on grasses and flowering/fruit producing plants; such as, butterflies, bees, some birds and mammals, ungulates etc.	All treatment areas.
Misc.	Damaged, cull or defective trees - Do not fell or remove. Leave for wildlife tree and snag recruitment.	Provide for species reliant on decadent trees or snags; such as, owls, fisher, bats and woodpeckers.	All treatment areas.
Misc.	Existing dead wood; standing and down - Avoid and protect existing snags and down wood ≥ 10 inches dbh to the greatest extent possible. Use treatment skips to avoid large dead wood (>20 inches dbh) or areas of accumulated standing and down dead wood.	Preserve existing dead wood to provide for species reliant on it; such as, owls, fisher, bats, woodpeckers, etc.	All treatment areas, especially DELSH and pine oak restoration
Misc.	Create hard snags and large down wood - in units where snags or down wood are deficient (< 4 snags per acre) and where it is desirable to eliminate trees $>10"$ dbh, (eg. girdle a Douglas fir to favor a black oak) Distribute as singles and clumps, across all treatment types. Leave snags cut as operational danger trees for down wood.	Provide hard, dead wood until the stand resumes producing dead wood through natural processes. Provide for species reliant on snags and large down wood; such as, owls, flying squirrels, fisher, bats, woodpeckers, cavity nesting birds, etc	All treatment areas, especially DELSH, pine oak and meadow restoration
Misc.	Underburning – avoid spring burning serpentine habitat with potential host plants (<i>Viola halli</i>) for coronis fritillary.	Minimize impacts to at-risk species	Serpentine within treatment areas
Misc.	Incidental sightings of sensitive species - Follow the design criteria and mitigation measures in relevant wildlife consultation documents, recovery documents, management plans or Forest Service policy.	Minimize adverse impacts to at-risk species.	All treatment areas.

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Misc.	Legacy trees – greater than 120 years in age based on tree characteristics described in project marking guidelines would be retained in all treatment units.	Maintain legacy trees for heterogeneity, future large dead wood and benefit multiple species.	All treatment areas.
Misc.	Retention of large hardwoods – will be implemented per marking guidelines for all treatment units.	Maintain habitat diversity and benefit multiple species.	All treatment areas.
Misc.	Untreated buffers of active bird nests encountered during project activities would be large enough to avoid soliciting a stress response that causes an adult to flush from incubating eggs or nestlings, avoid feeding young or exhibit defensive behavior until young have fledged.	Minimize adverse impacts to breeding migratory birds and raptors.	All treatment areas.

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Appendix A Map 1. RTV known nest trees to retain. Coordinates available from wildlife biologist.



Appendix B – Briggs Creek RTV High Priority Site Conservation Plan Summary

Introduction

The Briggs Creek Red Tree Vole (RTV) High Priority Site Conservation Plan (hereafter “The RTV Plan”) is available in the Upper Briggs Restoration Project Record. This appendix provides a summary of the analysis utilized to determine 1) land use allocations managed consistent with red tree vole conservation, 2) high-priority sites outside those areas, 3) connectivity areas, and 4) areas where surveys and site management are no longer needed. In addition, this appendix explains how the RTV plan affects other resources in the Upper Briggs Restoration Project.

Summary

The red tree vole (*Arborimus longicaudus*) is a category C survey and manage species. The objective for category C species is to identify and manage high-priority sites to provide for a reasonable assurance of species persistence. Until high priority sites can be determined, manage all known sites (USDA and USDI 2-001: 10). Effective in May 13, 2016, the high priority site management recommendations for the red tree vole were completed (Huff 2016). The high-priority site management recommendations outline a management approach under the survey and manage standards and guidelines to provide for a reasonable assurance of species persistence across the range of the species on forest service and Bureau of Land Management (BLM) lands.

The 2001 record of decision and standards and guidelines (USDA and USDI 2001) allow for the identification of high-priority sites that must be managed to provide for a reasonable assurance of persistence of the taxon or the procedures for designating such sites locally, as well as non-high priority sites that no longer need to be managed for the benefit of those species. Management recommendations may also identify areas where it is no longer necessary to continue surveys prior to habitat-disturbing activities or strategic surveys for the taxon (USDA and USDI 2001: 19-20). The following summary of the analysis for the Upper Briggs Creek Restoration Project incorporates by reference the high-priority site management recommendations (Huff 2016). This particular fifth-field watershed, Briggs Creek, is 43,726 acres of which, 95 percent is National Forest (NF) managed by the Wild Rivers Ranger District. Approximately 45 percent of the NF lands provide suitable habitat for red tree voles. Fifty-two percent of NF lands in the watershed is within land management allocations that are managed consistent with red tree vole conservation. This red tree vole conservation plan (RTV Plan) identifies an additional 1,780 acres outside of those land allocations that would also be managed consistent with red tree vole conservation. The RTV Plan also identifies areas in the watershed that would continue to be subject to pre-disturbance surveys per the red tree vole management recommendations, survey protocol and subsequent management of any known sites. The RTV Plan and the survey areas collectively provide habitat that would be managed consistent with red tree vole conservation over approximately 76 percent of the watershed containing approximately 80 percent of the available suitable habitat. Therefore, a reasonable assurance of red tree vole persistence will be provided within this fifth-field watershed.

The RTV Plan summarized here was developed consistent with the High Priority Site Management Recommendations for the Red Tree Vole (*Arborimus longicaudus*) Version 1.0 (Huff 2016, hereafter HPS MR), to provide a reasonable assurance of RTV persistence within the Briggs Creek fifth-field watershed located entirely within Josephine County, Oregon. The goal of the plan is to identify National Forest System lands (USDA Forest Service) that would be managed to provide suitable habitat for a well distributed population of red tree voles and allow linkages to adjacent watersheds. The conservation plan covers approximately 23,442 acres (57 percent) of National Forest lands in the watershed. The RTV Management Plan for the Briggs Creek 5th Field Watershed

(RTV Plan) is available in the project record and details how the conservation plan meets the rule set from the HPS MR and ultimately provides a science-based conservation strategy for RTV persistence. This appendix summarizes the RTV Plan and provides further evaluation of effects of the Plan on other resources.

Upon plan approval through the final decision document for the Upper Briggs Creek Restoration Project, National Forest System lands within the 5th-field watershed would be designated in one of four categories as follows:

- 1) **LUA-RTV** - Areas managed consistent with RTV conservation within reserve land use allocations (LSR, 100-acre LSRs, wild river, large riparian reserves and 70-acre northern spotted owl nest patches). No activities would occur in these areas which trigger pre-disturbance surveys for RTV.
- 2) **HPS** –high-priority sites designated for RTV conservation overlap other land allocations including riparian reserve, special wildlife sites, matrix and botanical areas. No activities would occur which trigger pre-disturbance surveys for RTV in these HPS.
- 3) **Non-HPS** - Non-high priority sites are all remaining areas and would not be designated for RTV conservation. Pre-disturbance RTV surveys and/or site protection buffers would not be required in this designation.
- 4) **Connectivity Areas** include small riparian reserves not identified as LUA-RTV and additional habitat corridors in between HPS and LUA-RTV. These areas are at least 300 feet wide and would not likely provide long-term occupancy by a red tree vole population but would provide dispersal habitat to larger patches of habitat. Management of these connectivity areas would not trigger pre-disturbance surveys for red tree voles.

National forest lands in the watershed where suitable habitat was not adequate to meet the ruleset for the RTV Plan would require pre-disturbance surveys per the red tree vole survey protocol. These areas are not part of the RTV Plan for the Briggs Creek watershed and are displayed in the RTV Plan maps (Figures 5 and 6).

Background

Purpose of Document in Relation to Policy

Red tree voles are considered a category C survey and manage species under the Northwest Forest Plan, for which the objective is to “[i]dentify and manage high-priority sites to provide for reasonable assurance of species persistence. Until high-priority sites can be determined, manage all known sites (USDA Forest Service and USDI Bureau of Land Management 2001, Standards and Guidelines p 10). Mitigation prior to establishing high-priority sites requires pre-disturbance surveys and a minimum 10-acre habitat protection buffer surrounding one active or assumed active nest tree located during surveys, with sites incrementally growing depending on the number of nests located (USDA Forest Service and USDI Bureau of Land Management 1994, 2001; Rosenberg et al. 2016).

The HPS MR for red tree voles transmitted to field units in May, 2016, outlines a process to develop a conservation plan intended to provide a reasonable assurance of species persistence in one or more fifth-field watersheds (Huff 2016). Furthermore, the conservation plan must be included in project-level National Environmental Policy Act (NEPA) analyses conducted by the District. Upon plan approval, areas within the watershed(s) and under Forest Service management designated as non-high priority sites will no longer require surveys prior to habitat-disturbing activities nor site or habitat protection because they are not considered as habitat necessary to provide for a reasonable assurance of red tree vole persistence (Huff 2016; USDA Forest Service and USDI Bureau of Land

Management 2001).

The Briggs Creek RTV Plan provides a reasonable assurance of red tree vole persistence and a science-based conservation strategy. The RTV Plan documents application of the rule set provided in the HPS MR within the Briggs Creek watershed on National Forest System land managed by the Wild Rivers Ranger District (“District”). This watershed is located in southwest Oregon, and entirely within the southern portion of the red tree vole’s range.

Summary of Rule Set Used in Developing the RTV Plan

The rule set described by Huff (2016) is aimed at providing a well-distributed, interconnected population of red tree voles throughout federally managed lands in fifth-field watersheds. The key objective is to provide suitable habitat for species persistence within the watershed and allow movement (hereafter “connectivity”) of red tree voles within the watershed and into adjacent watersheds. A detailed description of the ruleset and considerations for delineating land use allocations consistent with red tree vole management, high priority sites, connectivity areas, and non-high priority sites is provided in the Briggs Creek RTV Plan. The following is a summary of that process.

The rule set requires identification of the following elements, taken from Huff (2016:14):

- 1) Land-use allocations managed consistent with red tree vole conservation;
- 2) High-priority sites outside of those areas;
- 3) Connectivity areas linking sites and land-use allocations managed consistent with red tree vole conservation;
- 4) Non-high priority sites where pre-disturbance surveys and site management are no longer required;
- 5) Information gaps;
- 6) New information that would trigger revision of the RTV Plan.

Conservation Plan

This RTV Plan was developed with an iterative process which included consultation with Forest and Regional staff. The initial step was to (1) develop maps of federal land-use allocations and identify allocations that are managed consistent with RTV conservation, (2) identify non-federally managed lands, (3) identify areas of serpentine soils, (4) identify recently burned areas, and (5) develop maps of habitat suitability.

The second step incorporated aerial imagery and on-the-ground knowledge to evaluate habitat extent and connectivity within the Briggs Creek watershed, and delineate high priority site locations and connectivity areas within the watershed but outside of lands managed consistent with red tree vole conservation per pages 16-20 of the HPS management recommendations.

The third step was to evaluate connectivity between Briggs Creek watershed and adjacent fifth-field watersheds. Aerial image interpretation, GNN vegetation information, RAVG fire intensity mapping and on-the-ground knowledge were used to identify areas of “inter-watershed” connectivity (HPS MR pp 20-23).

1) Land-Use Allocations Managed Consistent with RTV Conservation (LUA-RTV)

Late-successional reserve (LSR), wild river, and riparian reserves on large perennial streams are the only land allocations with management standards and guidelines consistent with red tree vole conservation that would support long-term red tree vole persistence in the Briggs Creek watershed (Figure B-1). This management allows activities that do not trigger pre-disturbance surveys such as thinning stands less than 80 years in age. Most LSR is in the southern portion of the watershed. The northern portion of the watershed has 126 acres of “100-acre” LSRs and 400 acres of northern

spotted owl nest patches (300m buffer of an activity center) outside of the larger LSR. Riparian reserves are intended to not only provide habitat for aquatic and riparian dependent species, but also provide connectivity corridors between LSRs (NWFP ROD 1994, B-13). Collectively, 52 percent of Federal lands in Briggs Creek watershed is LUA-RTV (Table B-1, Figure B-5). Other administratively withdrawn allocations such as botanical areas and special wildlife sites may not be entirely managed consistent with red tree vole conservation depending habitat objectives for the site (eg. the Horse Creek Meadow wildlife site includes meadow and hardwood habitats that would benefit deer, elk and many other species) and are not included in LUA-RTV.

2) Non-federally Managed Lands

Approximately 5 percent of the Briggs Creek watershed is privately managed (Table B-1, Figure B-1). The remaining 95 percent is managed by the Wild Rivers Ranger District. Most of the private land is in a checkerboard configuration in the southern portion of the watershed. There is also a quarter of a section of private land in Briggs Valley north of Sam Brown campground.

3) Serpentine Soils

Approximately 16 percent of National Forest lands in the watershed are mapped as serpentine soils (Table B-1). A large portion of these soils occur in the western part of the watershed (Figure B-2). Jeffrey pine, sugar pine, incense cedar and Douglas-fir dominate the overstory of serpentine areas that have survived recent fire activity, however due to the natural chemical composition of the soil which is harsh for most vegetation, forest canopy cover is typically lower than 60 percent except in moist drainages and areas with deeper soil that are adjacent non-serpentine soil. Therefore, serpentine areas are not considered suitable red tree vole habitat except where Douglas-fir persists in stand with greater than 60 percent canopy cover.

4) Recently Burned Areas

Recent fires that have influenced the distribution of red tree vole habitat in the watershed include the 2014 Onion fire and the 2018 Taylor Creek and Klondike fires. Figure B-3 displays the known extent of fire history in the watershed from about 1940 to present. As of 2018, the entire watershed has experienced fire to some degree. Post-fire imagery for the Onion Mountain, Taylor Creek and Klondike fires that measure the level of fire severity or intensity based on post-fire soil mapping (BARC) or vegetation loss (RAVG) was used to update the habitat mapping used for the RTV Plan explained below.

5) Habitat Suitability

The HPS MR allows for assessment of suitable habitat through modeling approaches (Huff 2016 p 14). Habitat models provide an appropriate approach for assessing large areas for conservation planning and a means for including areas where tree voles may be present but not detected or where they may be absent because suitable habitat may not be presently occupied (Rosenberg et al. 2016).

Due to the effects of the Taylor Creek and Klondike fires in the Briggs Creek watershed, this RTV Plan uses the 2012 GNN vegetation data (Oregon State University (<http://www.fsl.orst.edu/lemma/>) updated by BARC fire severity data for the 2014 Onion Mtn fire, and Sentinel-RAVG fire intensity data for the 2018 Taylor Creek and Klondike fires to identify suitable habitat using the Van Norman 2014 description of red tree vole non-habitat; 1) non-forest areas (eg. > 90% basal area loss from fire, rock outcrops, etc.), 2) stands with no Douglas-fir, western hemlock or Sitka spruce, 3) stands of any age with less than 60 percent canopy closure, and 4) stands < 20 years old (Huff 2016, p 14).

Areas that burned with high soil burn severity according to BARC data for the Onion Mountain fire

are considered non-habitat. The Sentinel RAVG data measures fire intensity in increments of vegetation basal area loss from 0 to 100 percent. For the Klondike and Taylor Creek fires, areas mapped with > 50% basal area loss are considered non-habitat. Areas with 26-50% basal area loss that had less than 80 percent canopy cover prior to the fire, are also considered non-habitat, while Douglas-fir stands with 80 percent or more canopy cover prior to the fire with 26-50% basal area loss are still considered suitable habitat. The latter accounts for about 2,500 acres in the watershed that may still provide habitat. All remaining Douglas-fir stands with greater than 60 percent canopy cover, quadratic mean diameter of 10 inches or more, and 25 percent or less basal area loss from the fire are considered suitable habitat. The quadratic mean diameter of 10 inches was suggested by the district silviculturalist (Rob Barnhart, pers. comm.) as an acceptable proxy for tree age greater than 20 years old for this watershed though it is variable based on site productivity. This query produced a reasonable estimate of approximately 18,785 acres of existing RTV habitat on NFS lands in the watershed when compared to aerial imagery and field verification.

High Priority Sites (HPS)

To allow for greater distribution of red tree voles outside of the LUA-RTV, twenty-two high priority sites (HPS) were designated in portions of matrix, riparian reserve and other administratively withdrawn land-use allocations based habitat mapping and characteristics of known red tree vole sites. These sites cover 764 acres and range from 11-104 acres in size with a mean size of 35 acres. Care was taken to locate the sites in the best available habitat and were made larger to provide connected suitable habitat in areas with patchy canopy cover or younger stands or to include known red tree vole nest trees. Eighty three percent of the area in the HPS is suitable habitat. Seven of the sites include known red tree vole nests. The HPS are within 1 km of at least 3 other HPS or LUA-RTV, with the exception of one site at the watershed boundary on Onion Mountain that is connected to 2 HPS and a large patch of suitable habitat in the adjacent watershed. They are connected by suitable habitat within LUA-RTV or connectivity areas described below. Detailed information and location of the HPS are provided in Tables B-1 and B-2 and Figures B-5 and B-6.

Connectivity Areas

The RTV Plan uses linear connectivity corridors to provide habitat connectivity between HPS and LUA-RTV. These corridors are >300 feet wide and include small riparian reserves and additional habitat to increase suitable habitat connectivity around gaps or forested areas with less than 60 percent canopy cover. Some connectivity areas are extensions of riparian reserves to provide connectivity across ridgelines. Connectivity corridors cover approximately 1,016 acres (2%) of the watershed.

Identification of habitat connectivity to adjacent watersheds was based on adjacent reserved land allocations (LSR, wilderness) outside of the Briggs Creek watershed and any substantial linkages of existing suitable habitat between watersheds. However, habitat in adjacent watersheds is not designated as part of this RTV Plan.

The habitat map (Figure B-4) shows limited post-fire habitat connectivity across the ridgeline with the Josephine Creek-Illinois River watershed to the south, which is also within the LSR (Figures B-1 and B-4). Connectivity also appears limited with the Klondike Creek-Illinois River watershed. A small amount of habitat still exists where the LSR crosses the ridgeline and would be managed consistent with red tree vole conservation in the long-term. Likewise, there is limited habitat connectivity across the ridgeline with the Deer Creek watershed. The habitat condition in this south portion of the Briggs Creek watershed does not provide opportunities to delineate HPS or connectivity corridors that meet the spacing and habitat contiguity requirements in the ruleset which is why they are identified as areas that would require pre-disturbance surveys (described later).

In addition, LSR in the Hellgate Canyon-Rogue River watershed is adjacent north of the Briggs Creek watershed. A combination of connectivity areas, HPS and LUA-RTV are delineated in this

plan to provide habitat connectivity with that LSR. A small area near Onion Mountain with limited habitat connectivity in the Hellgate Canyon-Rogue River watershed is identified for pre-disturbance surveys.

The ridgeline with the Silver Creek watershed to the west is predominantly serpentine and burned in the Biscuit fire and in the Klondike and Taylor Creek fires. For these reasons, little habitat or connectivity exists on or near the ridgeline and the area has a low likelihood of providing suitable habitat for red tree voles for decades.

A high use paved road on the east ridgeline shared with the Lower Applegate River watershed may inhibit dispersal, however connectivity areas and HPS delineated along this ridgeline contain some of the heavier tree canopy available next to the road and across the ridgeline.

In summary, habitat connectivity from the Briggs Creek watershed into adjacent watersheds is limited to the north and east sides of the watershed due to lack of suitable habitat as a result of recent fire and serpentine influence along the south and west sides.

Non-High Priority Sites (Non-HPS)

Non-HPS are areas within the RTV Plan that are released from future management of red tree voles because the RTV Plan provides adequate amounts of well-distributed suitable habitat to ensure persistence of the species according to the HPS MR ruleset. Non-HPS cover approximately 25 percent of National Forest lands in the watershed, 17 percent of which is matrix (Table B-1, Figures B-5 and B-6).

Survey Areas

Suitable habitat within approximately 19 percent of National Forest lands in the watershed was fragmented by recent fires or serpentine to the extent that HPS could not be designated in these portions of the watershed to meet the spacing and connectivity requirements of the ruleset (Table B-1, Figures B-5 and B-6). These areas require red tree vole pre-disturbance surveys for any actions that would affect suitable habitat according to the Management Recommendations for the Oregon Red Tree Vole *Arborimus longicaudus* Version 2.0 and current survey protocol.

Relationship of Known Red Tree Vole Sites to High Priority Sites

Known RTV nest trees in the watershed are displayed in Figure B-5. Of 1,834 acres surveyed within the Briggs Creek watershed, 196 red tree vole nests were confirmed in individual trees though not all of them were active when they were discovered. These surveyed acres are outside of LSR and comprise 4 percent of NFS lands in the watershed. Given this density of nest trees within 7 percent of the habitat in the watershed prior to the 2018 fires, it is presumed that red tree voles were fairly well distributed throughout the watershed. Of the 196 nest trees, 27 were located in areas that burned with greater than 50 percent basal area loss and are assumed to be unsuitable. Seventy of the remaining nest trees are within HPS, and 28 are included in LUA-RTV. This leaves 71 nest trees that are not within an HPS or LUA-RTV, 47 of which are in matrix, and 24 within land allocations that are not managed for timber production.

Information Gaps

The amount and distribution of suitable habitat included in the RTV Plan is believed to be sufficient for the persistence of red tree voles in the watershed based on research used to develop the rule set (Huff 2016) and the best available data to identify suitable habitat including air photos, vegetation maps based on remote sensing technology and field verification. No information gaps were identified that caused unreasonable assumptions about the ability of this Plan to meet the ruleset and provide a reasonable assurance of persistence of red tree voles within the Briggs Creek watershed.

Information to Trigger a Change in Management

The Briggs Creek RTV Plan provides the management direction for red tree voles in the Briggs Creek fifth-field watershed until updated, replaced or removed through a new project NEPA decision (Huff 2016:24). The expected longevity of the RTV Plan is 15 years or sooner if new information would necessitate an update. If events occur in which vegetative conditions on the ground would be changed to those areas identified as contributing to red tree vole conservation and they no longer are functioning to provide for red tree vole, then a review and update of this RTV Plan would be needed. An example of an event that would trigger a review of and may require an update to this RTV Plan would be an extensive wildfire occurring in the watershed. Although habitat models other than what we used would alter the estimates of the distribution and abundance of suitable habitat, the general corroboration with GIS-based data on vegetation and stand age, as well as photo imagery, and field verification provide strong support that the foundation of the plan would remain unchanged if different models were used. However, if future data determines that the RTV Plan misinforms delineations of habitat suitability now and in the future, then a revision to the RTV Plan may be appropriate. Climate change and plant disease may alter the distribution of red tree vole habitat, but any predictions on such changes would be naïve to make at this time. Fire has had a major effect on the extent of red tree vole habitat within the RTV Plan watersheds (Figure B-2) and it is reasonable to expect fires in the future. The extent of currently suitable habitat and areas that are expected to mature into suitable habitat will provide future resilience.

How the RTV Plan Affects Other Resources

As mentioned above, management of areas included in the RTV Plan (LUA-RTV, HPS, connectivity corridors) would not trigger pre-disturbance surveys for red tree voles. This will restrict other resource management in portions of the RTV Plan that overlap land use allocations with standards and guidelines that are not consistent with red tree vole conservation. These areas are primarily within high priority sites and connectivity corridors.

Other resources that would be affected by implementation of this RTV Plan include those targeted for management by certain land allocations listed in the table below which displays the approximate acres of RTV Plan elements within various land allocations.

SNF LMP Land Allocation:	Matrix/Partial Retention	Riparian Reserve	Special Wildlife Site	LSR	Botanical Area	Backcntry Recreation	Wild River	Scenic- Recreation River	Total Acres
LUA-RTV	365 ¹	1,675	283	19,328	0	4	7	0	21,662
HPS	605	98	61	0	0	0	0	0	764
Connectivity	458	478	80	0	0	0	0	0	1016
Total RTV Plan Acres ²	1,428 (10%)	2,251 (46%)	424 (23%)	19,328 (100%)	0	4 (<1%)	7 (100%)	0	23,442
Survey Area	5,879 (40%)	1608 (33%)	284 (16%)	0	127 (76%)	0	0	0	7,897

¹ Areas where large riparian reserves were expanded to provide suitable habitat connectivity around gaps.

² Percentage shown (%) is that of the total land allocation acres in the Briggs Creek 5th field watershed.

The RTV Plan would limit options for vegetation management within the land allocations listed above. Opportunities for timber production would be limited in allocations identified as Matrix under the Northwest Forest Plan. Habitat management would be limited to what is consistent with red tree vole conservation in the special wildlife sites. Options for improving riparian biodiversity may be limited in the riparian reserves.

Management of these land allocations may be limited because vegetation management should be consistent with red tree vole conservation. First, Huff 2016 pages 25-27 states any activities in LUA-RTV (e.g. large riparian reserves) or connectivity areas delineated in the RTV Plan should not trigger pre-disturbance surveys for RTV as identified in the survey protocol (Huff et al 2012).

From Huff et al 2012 pages 5-10, activities that would trigger pre-disturbance surveys are those that meet *all three* of the following criteria:

- 1) The project is within the RTV Survey Zones (Upper Briggs is entirely within the Xeric Zone)
- 2) There is suitable habitat within the planning area that may potentially contribute to a reasonable assurance of persistence of tree voles. Suitable habitat in the Xeric Zone and more specifically the Briggs Creek watershed are stands that meet both:
 - a. Quadratic Mean Diameter (QMD) ≥ 16 " or Arithmetic Mean Diameter (AMD) ≥ 14 "
AND
 - b. The general habitat in the stand is mature, old growth, or older mixed-age conifer (typically over 80 years in age) with Douglas-fir having multi-layered canopies and heavy limbs or palmate branch clusters capable of supporting nests OR conifer-dominated mixed conifer-hardwood forests with canopy closure of intermediate, co-dominant and dominant trees $\geq 60\%$ and with two or more superdominant conifer trees per acre with foundations for rtv nests (e.g. large limbs, palmate branch clusters, well developed crowns, cavities, broken tops, forked trunks, multiple leaders, or dwarf mistletoe brooms). Superdominant trees typically have crowns that extend above the general stand canopy and have large branches in the upper canopy of the dominant trees in the stand.
- 3) The project disturbance is a habitat disturbing activity that has the potential to cause a "significant negative impact on the species' habitat or the persistence of the species at the site" (USDA and USDI 2001: S&G 22). This is further defined as "activities that would remove or modify the intermediate, co-dominant, dominant or pre-dominant/superdominant canopy within the stand may be considered habitat-disturbing to rest tree voles." (Huff et al 2012, p 10)

Activities that do not meet all three of these criteria, or that meet any of the Pechman exemptions would not trigger pre-disturbance surveys and could be implemented in accordance with the standards and guidelines for the land allocation (e.g. riparian reserve). Further examples of activities that would not trigger pre-disturbance surveys are described in the RTV survey protocol (Huff et al 2012).

In HPS, activities "should not remove or modify nest trees, the canopy structure of the stand, or remove any of the dominant, codominant or intermediate (Daniel et al. 1979) crowns. This includes activities that may isolate nest trees or alter the microclimate within the stands. Some activities may be appropriate if they maintain or improve, and do not degrade (short- or long-term), the habitat condition. Examples of these activities include planting, road decommissioning, trail and road maintenance, culvert replacement, manual vegetation maintenance, special forest product removal, and hand piling and jackpot burning to reduce fire hazard. Because red tree voles are potentially affected by heat and smoke that penetrates the crown, burning should not occur beneath nest trees or where heat and smoke would penetrate the crown" (Huff, 2016 and

USDA and USDI 2000b:15).

Furthermore, “fuels management consistent with red tree vole conservation include pile or jackpot burning to reduce excessive accumulations of fuels. Understory burning can be used to reduce fuel loading and vertical fuel continuity. Wildfire in stands that are managed using underburning are generally less severe, and fire suppression is more effective. Fuels treatment should be considered adjacent to Habitat Areas [HPS] to provide further protection where natural fire frequencies have been altered or where fire hazard is high. Burning should be conducted during a time of year when the likelihood of fire escaping into the tree canopy is lowest, but may occur during any time of year under appropriate weather conditions. However, because red tree voles are potentially affected by heat and smoke that penetrates the crown, burning prescription should direct heat and smoke away from Habitat Areas [HPS]” (Huff, 2016 and USDA and USDI 2000b:17).

Care was taken in delineation of HPS and connectivity corridors to balance the spatial requirements of the RTV HPS management strategy guidelines and provide a reasonable assurance of RTV persistence within the watershed with the affected land allocations to minimize the acres that may be removed from intended management for other resources and other wildlife and plant species. The acres of HPS and connectivity corridors that overlap proposed treatment units under Alternative 2 are shown below. Treatments in these areas of overlap would be consistent with RTV management described above. Figure B-7 displays the RTV Plan with the proposed treatment units.

Upper Briggs Restoration Objective	Acres RTV HPS	Acres RTV Connectivity	LUA-RTV	% of treatment acres
DELSH	29	36	109	16
Riparian Restoration	0	10	41	28
Pine Oak	94	46	15	22
Rare Plants	0	0	3	<1
Meadow Restoration	0	5	114	63
Ridgeline FMZ	82	132	0	19
Roadside FMZ	24	77	44	20

Table B-1. Acreage of land-use allocations, RTV Plan and suitable habitat within the Briggs Creek watershed.

Spatial Unit	Total Acres	% of WS	% of Federal WS	Suitable Habitat Federal Acres (% total)
Briggs Creek Fifth Field Watershed	43,726	100	NA	19,399 (44)
Federal management	41,364	95	100	18,785 (45)
Total LSR, Riparian Reserve, Wild River	24,149	55	58	11,287 (47)
Total Administratively withdrawn allocation (Backcountry Rec, Botanical Area, Special Wildlife Site, Scenic River)	2,730	6	7	1,196 (44)
Total Matrix land use allocation	14,485	33	35	6,302 (43)
Total Suitable RTV habitat on NF lands	18,785	41	44	18,785
RTV Plan within the watershed (LUA-RTV, Connectivity Areas, HPS)	23,442	54	57	11,514 (49)

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Land-use allocations managed consistent for tree voles (LUA-RTV) not including small riparian reserves	21,662	49	52	10,408 (48)
Connectivity corridors	1,016	2	2	768 (76)
High Priority Sites	764	2	2	638 (83)
Acres requiring pre-disturbance surveys	7,898	18	19	2,476 (31)
Non-HPS (Total WA Federal minus HPS, LUA-RTV, Connectivity Areas, no pre-disturbance surveys required)	10,189	23	25	4,610 (45)
Matrix Non-RTV Plan	7,214	16	17	3,386 (47)
NHP Riparian Reserve (small, with isolated habitat)	1,061	2	2	381 (34)
Non-high priority sites in other LUA	1,914	4	5	843 (44)
Serpentine soils (NFS lands)	6,689	15	16	1,118
Serpentine in RTV conservation strategy	5,013	11	12	990
Serpentine in non-high priority sites	1,697	4	4	139

Table B-2. Characteristics of habitat and topography for the RTV Plan within the Briggs Creek watershed.

Spatial Unit	Total Acres	Suitable Habitat Federal Acres (% total)	Acres forested 40-60% CC low contrast (% total)	Acres Aspect SE-S-SW-W (% total)	Acres Aspect NW-N-NE-E-Flat (% total)	Low RHS ¹ ridgeline (% total)	High RHS low and mid-slope (% total)	Riparian Reserve (% total)
Briggs Creek Fifth Field Watershed	43,726	19,399 (44)	3,395 (8)	23,515 (54)	20,211 (46)	17,363 (40)	26,363 (60)	11,011 (25)
Total Suitable RTV habitat on NF lands	18,785	18,785		16,791 (89)	1,994 (11)	4,432 (24)	14,353 (76)	10,079 (54)
Known RTV nest trees	196 trees	163 (83)	6 (3)	158 (81)	38 (19)	14 (7)	182 (93)	42 (21)
LUA-RTV (not including small riparian reserves)	21,662	10,408 (48)	1,854 (9)	11,231 (52)	10,431 (48)	6,987 (32)	14,675 (68)	6,992 (32)
Connectivity corridors	1,016	768 (76)	65 (6)	500 (49)	516 (51)	189 (19)	827 (81)	527 (52)
High Priority Sites	764	638 (83)	34 (4)	508 (66)	256 (34)	212 (28)	552 (72)	98 (13)
HPS 1 ²	11	11	0	11	0	0	11	0
HPS 2	48	45	1	45	3	0	48	11
HPS 3	36	34	1	28	8	0	36	0
HPS 4	37	28	3	20	17	15	22	1
HPS 5	16	13	1	16	0	0	16	0
HPS 6	40	34	2	23	17	0	40	7
HPS 7	23	21	0	12	11	0	23	13
HPS 8	40	40	0	10	30	14	26	0
HPS 9	45	38	3	36	9	0	45	6
HPS 10	13	13	0	5	8	0	13	0
HPS 11	32	15	5	29	3	3	29	0
HPS 12	17	16	0	12	5	4	13	0
HPS 13	17	17	0	16	1	0	17	0
HPS 14	18	17	0	6	12	8	10	0
HPS 15	32	24	3	8	24	3	29	20
HPS 16	104	76	4	62	42	90	14	5
HPS 17	32	25	2	21	11	0	32	8
HPS 18	26	20	1	12	14	25	1	0
HPS 19	45	40	2	36	9	12	33	10
HPS 20	68	60	3	59	9	20	48	18
HPS 21	37	32	1	34	3	18	19	0
HPS 22	28	22	2	7	21	0	28	5

1 RHS – relative habitat suitability is the potential for a site to produce high value nesting/roosting habitat for northern spotted owls based on the environmental conditions of a site (Davis et al. 2016). These are usually some of the best site conditions for red tree vole habitat.

2 See Figure B-6 for individual HPS locations.

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Figure B-1. Land-use allocations in Briggs Creek and within 2 miles of adjacent fifth-field watersheds. Riparian reserves within LSR, wilderness and wild river are managed to the more restrictive standards and guidelines of those allocations.

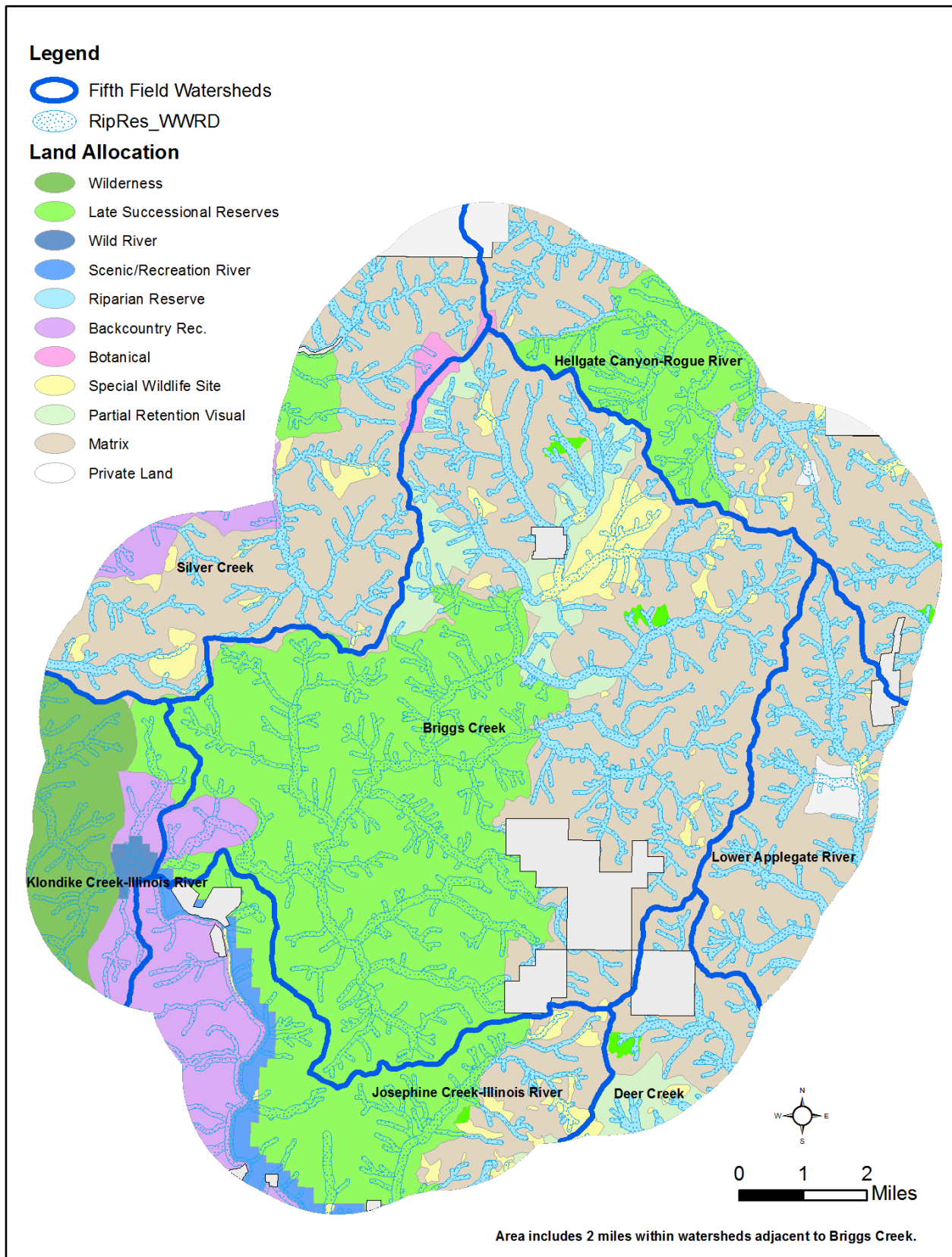
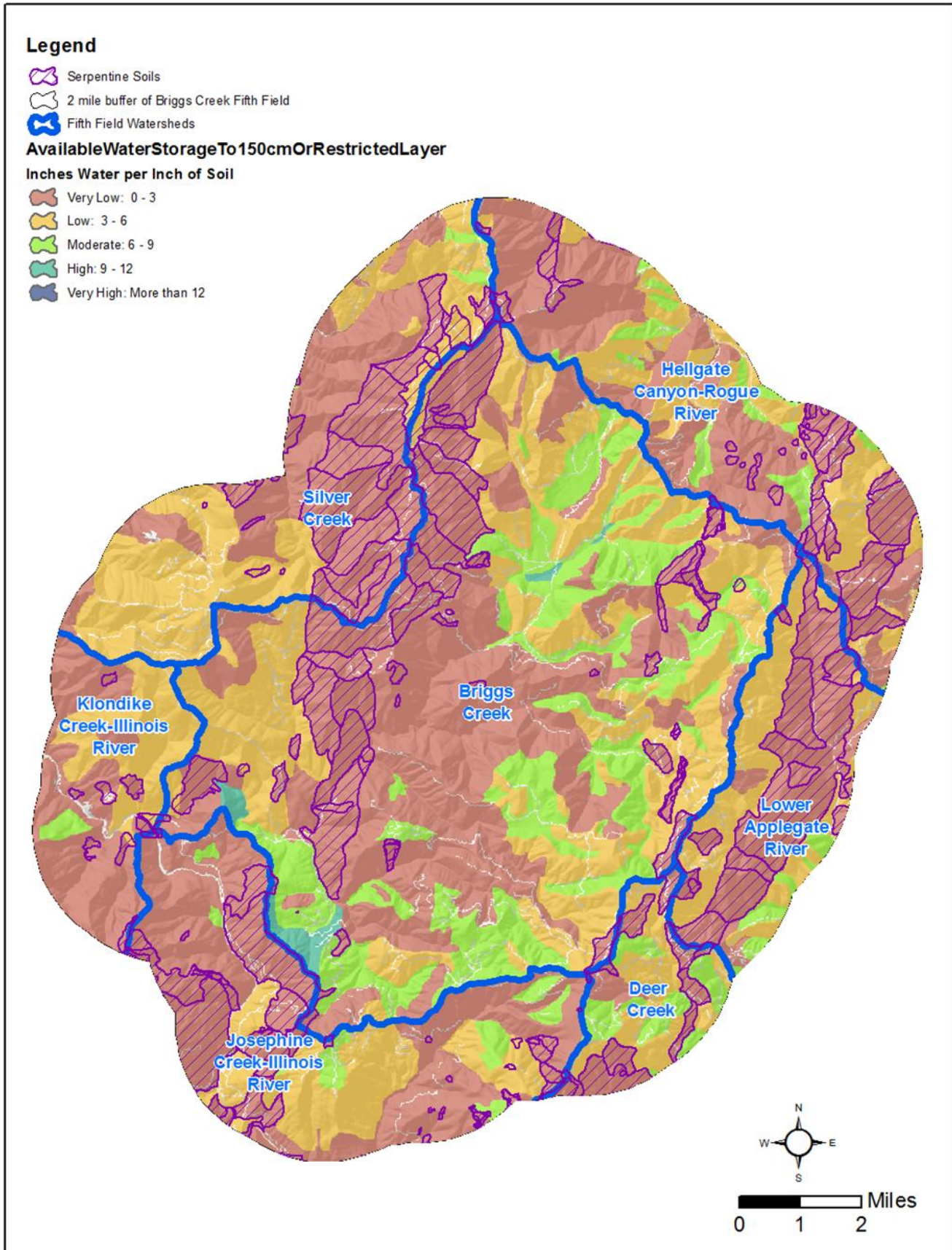


Figure B-2. Serpentine soils and soil water storage in the Briggs Creek fifth-field watershed and within 2 miles of surrounding watersheds.



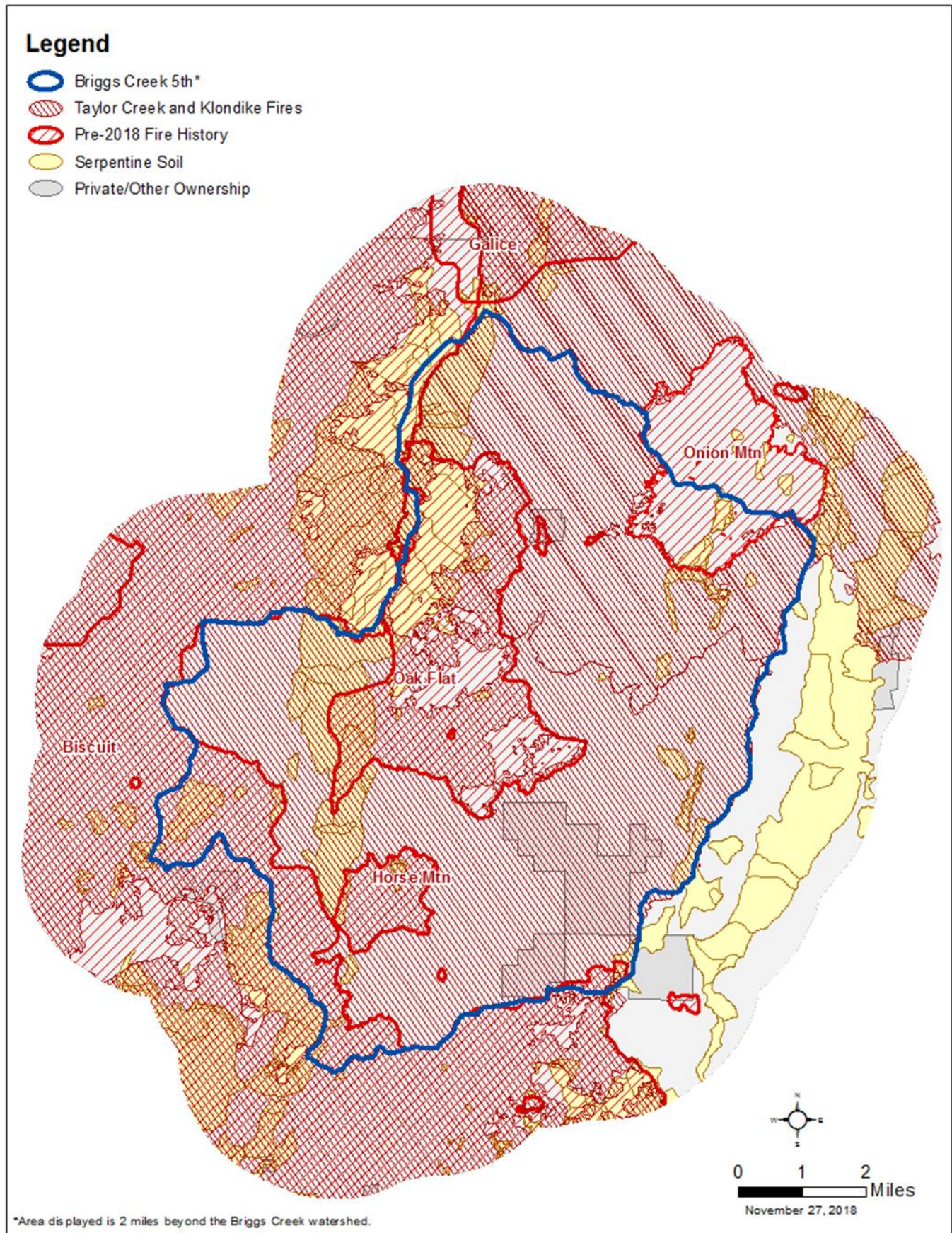


Figure B-4. Suitable red tree vole habitat based on GNN updated with fire intensity data within Briggs Creek and adjacent watersheds.

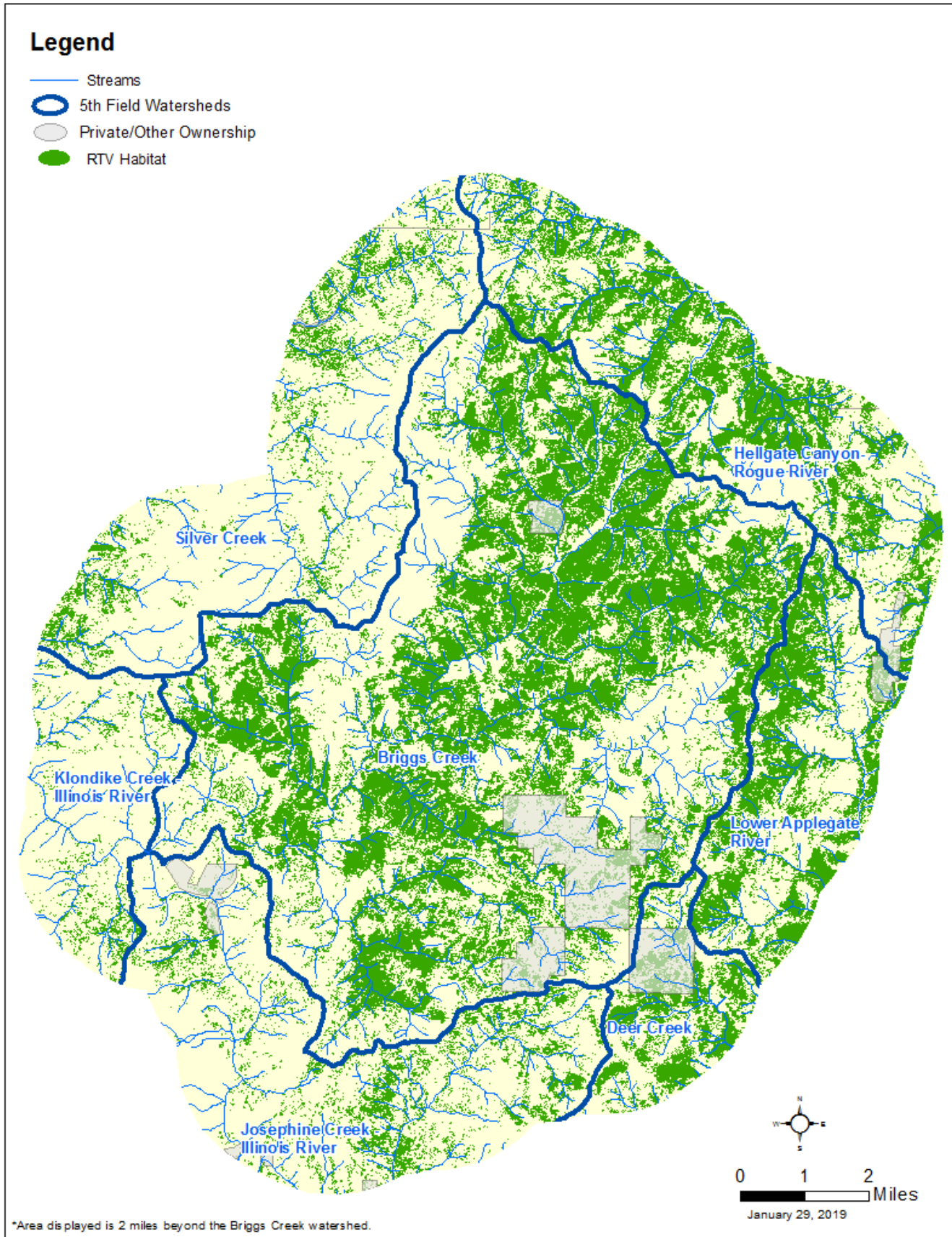
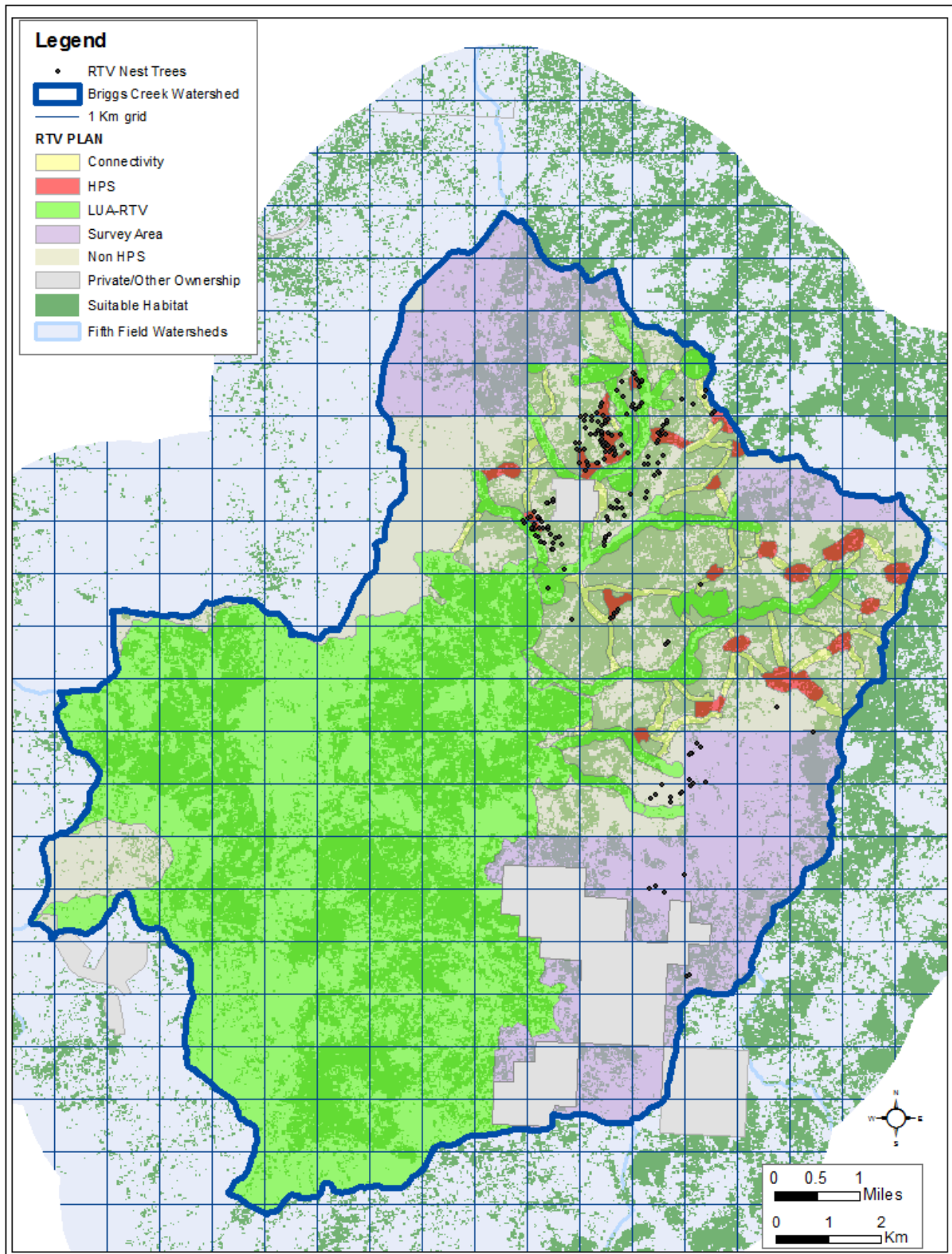
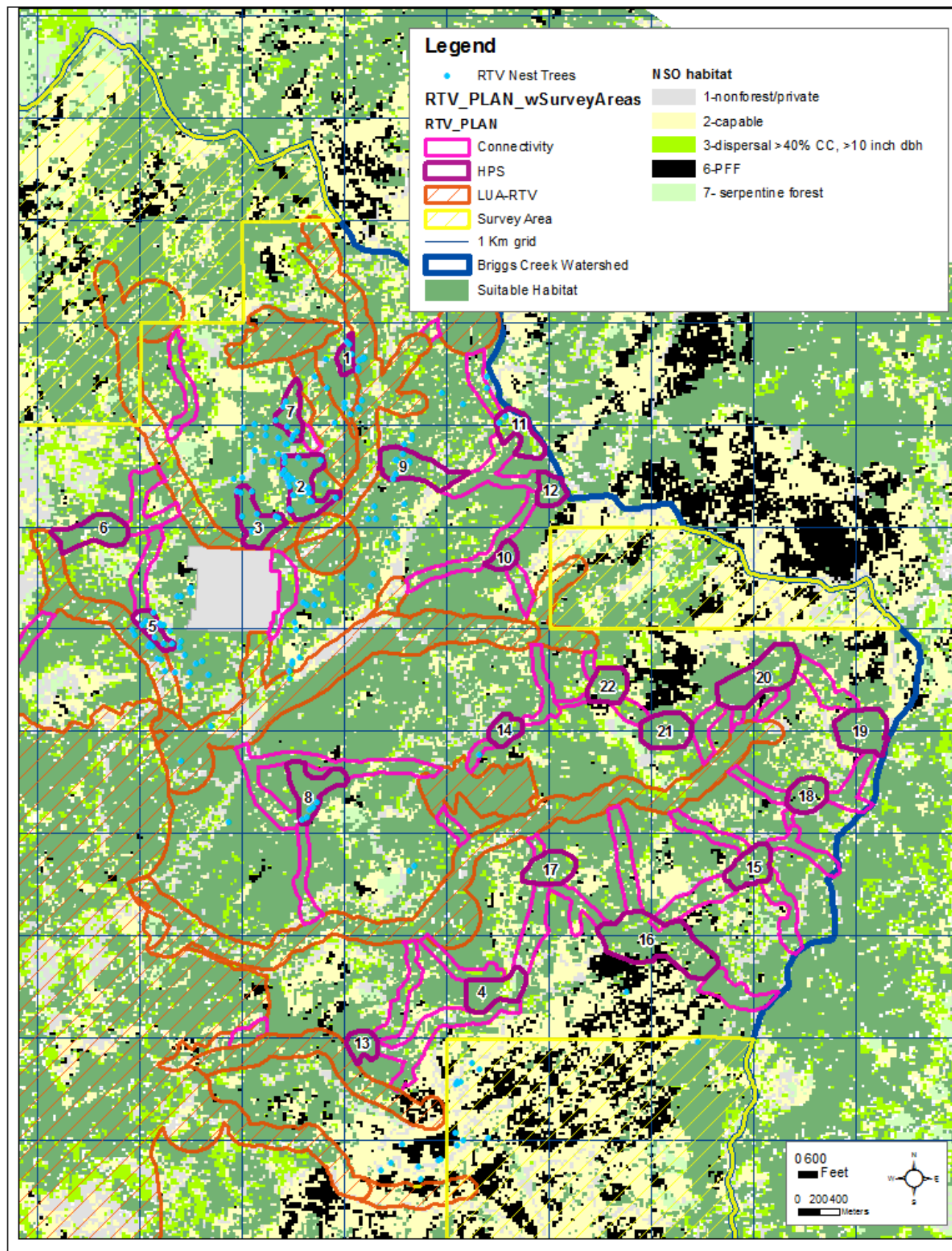


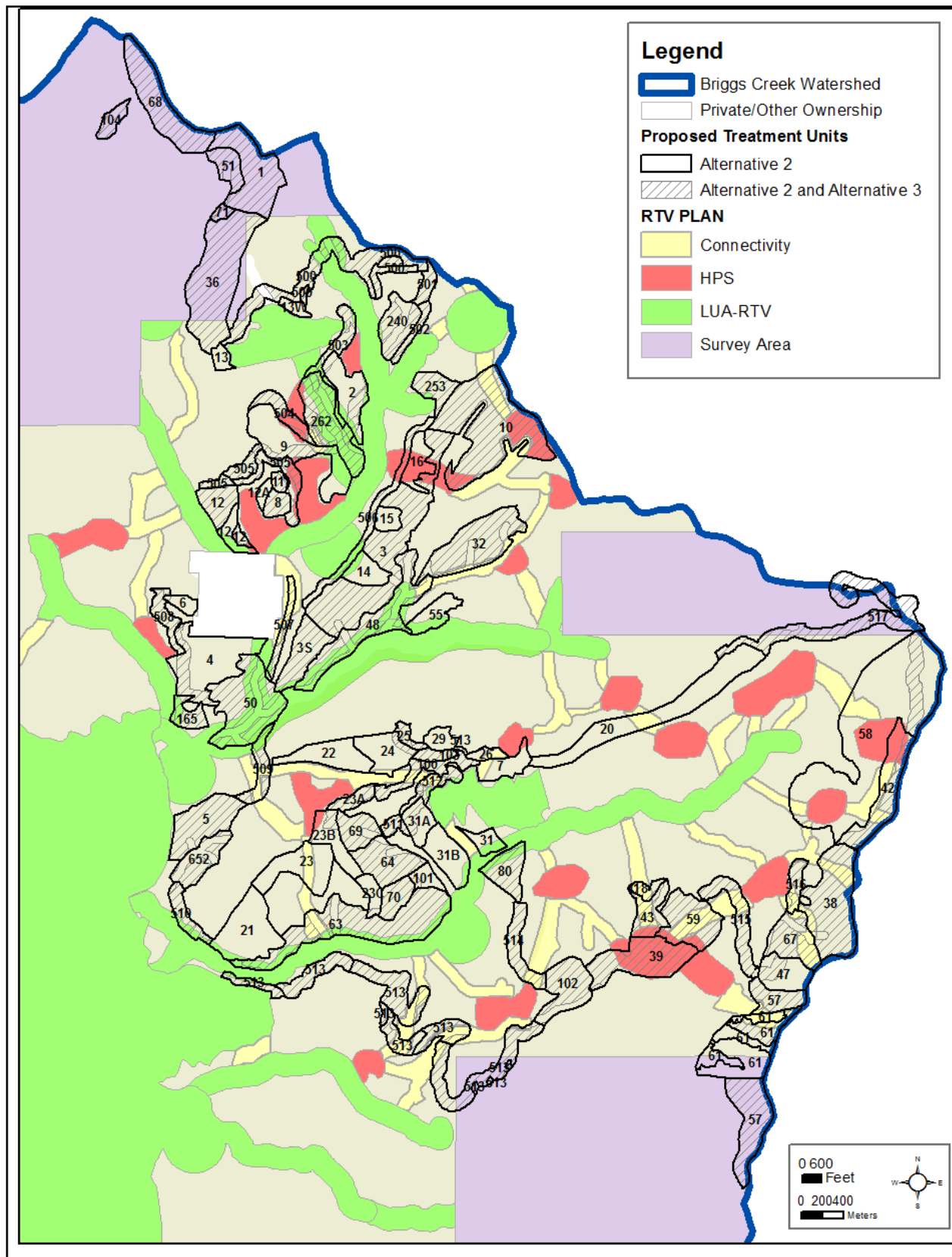
Figure B-5. Red tree vole conservation plan (RTV Plan) within the Briggs Creek watershed and suitable habitat.



Wild Rivers Ranger District, Rogue-River Siskiyou National Forest
 Figure B-6. RTV Plan High Priority Sites and surrounding habitat within the Briggs Creek watershed.



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 Figure B-7. Briggs Creek RTV Plan and Upper Briggs proposed treatment units.



Literature Cited

- Huff, R. 2016. High-priority site management recommendations for the red tree vole (*Arborimus longicaudus*) - version 1.0 March 2016. Portland, OR: USDI Bureau of Land Management and USDA Region 6 Forest Service.
- Huff, R., K. Van Norman, C. Hughes, et al. 2012. Survey protocol for the red tree vole, Version 3.0. Portland, OR: USDA Forest Service Region 5 and 6, USDI Bureau of Land Management Oregon/Washington. 52 p.
- USDA Forest Service. 1989. Land and Resource Management Plan - Siskiyou National Forest. Portland, OR: USDA Forest Service, Pacific Northwest Region.
- USDA Forest Service; USDI Bureau of Land Management. 1994. [Northwest Forest Plan] Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl [and] standards and guidelines for management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. Portland, OR.
- USDA Forest Service; USDI Bureau of Land Management. 2001. Record of decision and standards and guidelines for amendments to the survey and manage, protection buffer, and other mitigation measures standards and guidelines. Vol. 1. Portland, OR.
- Van Norman, K. 2014. Unpublished notes from red tree vole meeting (Ray Davis, FS/BLM; Eric Forsman, FS PNW research lab; Rob Huff, FS/BLM; Carol Hughes, FS/BLM; Jimmy Swingle, Oregon State University; and Kelli Van Norman, FS/BLM). On file with; USDI Bureau of Land Management, Oregon State Office, 1220 SW 3rd Avenue, Portland OR 97204.
- Personal Communication: Robert Barnhart, RRSNF Timber Program Manager, formerly the Wild Rivers District Silviculturalist, April 30, 2018.